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VARICOSITIES OF VEINS

CHOICE OF TREATMENT, AND END-RESULTS*

BY

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This subject naturally falls into three parts: (1) varicosities of veins, (2) choice of treatment, and (3) end-results, and it would appear desirable to consider it under these three headings.

Varicosities of Veins

I propose to confine my remarks to varices occurring elsewhere than in the anal canal, and, in order not to provoke too wide a discussion, to consider chiefly varicose veins in the lower limb; but it is necessary to remember that they may be met with in the pampiniform plexus, in the lower oesophageal region, occasionally in the walls of the chest or abdomen, and in the scalp, and also that they are not very uncommon in both the cranial and spinal parts of the pia mater. The fact that varicosity may affect the veins of the pia mater indicates a developmental origin, and the view, therefore, that varicose veins in the legs are the result of the upright posture and occupational factors such as prolonged standing would appear to be incomplete unless the influence of a congenital factor is assumed to be present also. It is probable that posture, by throwing an increased strain upon the unsupported leg veins, is contributory, but since varicose veins are occasionally found in quadrupeds such as horses the upright posture in man cannot be held to be solely responsible, while their occurrence in the meninges and the fact that many people who do prolonged standing go through life without developing varicose veins would further discount the effect of the upright position as the all-important factor in aetiology. That a primary congenital defect, whether in the venous walls, in the valves, or in the innervation of the veins themselves, is not the whole story is apparent from the fact that we do not find varicose veins in the legs of infants. Their frequent occurrence during pregnancy emphasizes the importance of an obstructive factor and possibly an endocrine one also, since varicosities sometimes appear quite early in pregnancy. Whether the weakness of the venous walls is of an inflammatory or non-inflammatory character, whether it is due to lack of nerve tonus or valvular insufficiency, or is the result of a form of new growth comparable to an angioma, is debatable, but in the case of the leg veins there can be no doubt of the influence of the two important factors to which reference has been made—namely, the inherent or congenital, and the obstructive or congestive.

Before further considering varicose veins in the lower limb it may be as well to make a few remarks about the common or adolescent variety of varicocele. This is a condition which, appearing at a time of physiological hyperactivity, is usually transient and requires for its relief merely a suspensory bandage for the left testis and the reassurance of the patient as to its insignificance. Certain of the Services, however, still require candidates who are affected by this condition to be treated by operation before they are accepted. Is it not time that a modification of such regulations should be advocated? What potential source of disability or invalidism is an adolescent varicocele in an otherwise perfectly fit young recruit when he is compared with one whose left pampiniform plexus is less tortuous and turgid? The only disadvantages from a Service point of view possessed by a man with varicocele would appear to be that in the Tropics the condition may be somewhat exaggerated, since venous tone is there

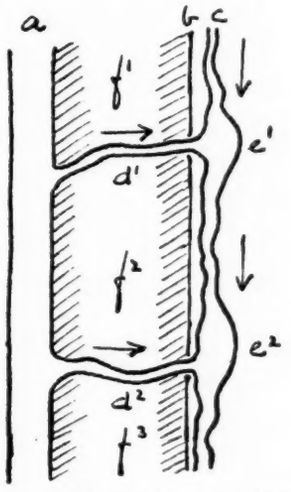

FIG. 1.—Diagrammatic illustration of varicose knots. Owing to defective valves the high intravenous pressure in the trunk, c, acts at e^1, e^2, in combination, when muscular action compresses the main deep vein, a, with the pressure transmitted along the connecting veins, d^1, d^2.

a, deep vein; b, deep fascia; c, varicose vein; d^1, d^2, connecting veins; e^1, e^2, varicose knots; f^1, f^2, muscle masses.

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diminished, and in a community of men living together there may possibly be psychological repercussions; but these considerations are insignificant. Minor degrees of varicocele are comparatively common, but with the passing of adolescence they disappear, and it is exceedingly rare to meet with the condition in middle-aged or elderly men. Operations for varicocele should therefore not be performed except in very exceptional circumstances. Already it is pleasing to note that the official viewpoint regarding varicocele is broadening in some Services, and I am indebted to the Medical Director-General of the Navy, Surgeon Vice-Admiral Sir Percival Nicholls, for kindly informing me that, according to Naval recruiting regulations to-day, a candidate with a varicocele may be accepted provided it is not likely to form a serious impediment to the efficient performance of duty. Such an outlook might be commended more generally.

A vein may be said to be varicose when it is dilated (usually irregularly), elongated, and tortuous. In the case of the leg veins the condition may affect the main superficial venous channels or their smaller tributaries. The irregularities in dilatation which give a beaded or pouched appearance to the affected veins depend upon pressure differences between the superficial and deep venous channels (Fig. 1).

Choice of Treatment

I propose to limit my remarks to the treatment of varicose veins and not deal with complications such as phlebitis, ulceration, or eczema. Leg varices may be treated by (1) excision or ligation, (2) the injection of sclerosing substances to produce local thrombosis, or (3) by combinations of these methods. No treatment is necessary for minor degrees when there are no symptoms; but such cases often progress, and indications for treatment may then arise.

Before locally treating any case of varicose veins, however, we should endeavour so far as possible to remove the cause, and while we know no way of influencing the congenital factor we may be able to lessen congestion by more rest, provide support in the form of an elastic stocking, elastic adhesive, or Unna's paste, or effect the removal of an abdominal tumour; while we must not lose sight of the fact that, after parturition, varicosities which have arisen in pregnancy frequently disappear. It is most important also to determine whether the deep veins are patent or not. If they have been occluded—for example, as a result of typhoid fever or white-leg—then the varicose enlargement of the superficial veins must be regarded as compensatory, and these must not be interfered with. If there is any doubt as to the patency of the deep veins a tourniquet should be applied above the varicose veins just tightly enough to occlude the subcutaneous veins, and the patient made to walk about. If the suction action of the contracting leg veins is able to empty the distended varicose veins the deep channels must obviously be open, but if the varicosities increase it must be concluded that the deep channels are occluded and the superficial veins must not be obliterated.

End-results

It is important to refer to this aspect before proceeding to a detailed consideration of the methods of treatment, because the two are interdependent: the treatment chosen must in great part depend upon what is found to be its end-result when compared with that following alternative procedures. It has already been stated that varicose veins are progressive; more veins may become involved even after adequate treatment, and if the progressive character of the condition is not recognized, whatever particular treatment has been undertaken may incorrectly be held to have failed. This fact accounts for some of the alleged recurrences after injection treatment; there can be no doubt, however, that following this treatment true recurrences do occur, and in most of such cases injection alone should not have been the method used. It should be remembered that when the intravenous pressure remains high the thrombus induced by injection may soon be canalized.

A study of end-results has shown that injection treatment alone is insufficient in cases where the varices are

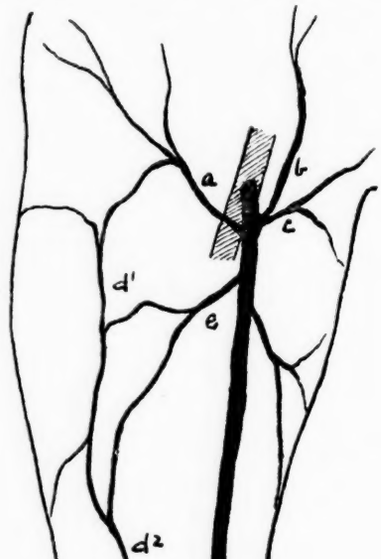

FIG. 2.—Diagrammatic representation of the saphenous vein in the thigh and its main tributaries, showing the necessity for ligating the vein above the highest of these to avoid the opening up of channels such as a, d', d², f, and a, d', e, and thereby the re-establishment of the main saphenous channel.
a, superficial circumflex iliac; b, superficial epigastric; c, superficial external pudic, tributaries of internal saphenous vein. The femoral vein is shaded.

practically limited to an internal saphenous system in which the great saphenous vein is much distended throughout owing to a rapid reflux of blood through its incompetent valves and in which the venous pressure is therefore high. In such cases where the Trendelenburg test is found to be positive, ligation of the internal saphenous vein above its highest tributary and just before its termination in the femoral vein is indicated. It is necessary to perform the ligation at this particular site, since recurrence may take place if reflux is permitted to occur into a tributary through failure to ligate the saphenous trunk above its entry (Fig. 2). Other cases liable to relapse after injection are those in which large localized venous pouchings occur with a high intravenous pressure, and certain of these are better excised.

Methods of Treatment

A study of end-results shows that some cases of varicose veins may be adequately dealt with by injection alone, others by combined injection and ligation, and still others by limited excisions. Choice of treatment must be determined by the particular group of case to which the patient belongs. It is therefore necessary to decide which patients are best suited for each of these particular varieties of treatment—namely, injection, injection with ligation, or excision.

Injection.—This method is suitable for relatively small and comparatively isolated varices such as are so commonly seen in young and middle-aged women. For the injection many different sclerosing agents have been used, but in 1937 H. I. Biegeleisen of New York drew attention to mono-ethanolamine oleate, claiming that it was less toxic and a better sclerosing agent than sodium morrhuate and that, being, in contradistinction to morrhuate, a definite chemical compound, it could be prepared in perfectly comparable batches. In Cardiff we have verified Biegeleisen's contention, and are now using mono-ethanolamine oleate, $C_{17}H_{33}COONH_2CH_2CH_2OH$. This is a deliquescent solid, which is made into a 5 per cent. solution that is slightly turbid; although it may safely be employed in this form it is better clarified by the addition of 25 per cent. glycerin or 2 per cent. benzyl alcohol. Five c.cm. or more may be used at weekly intervals. A firm thrombus is formed, and this solution is, in our opinion, the most satisfactory of the sclerosing agents. Morrhuate and quinine urethane solutions have their contraindications, while salicylates tend to be painful. None of these disadvantages attends the use of the oleate solution, and as it is only slightly irritant to the perivenous tissues, ulceration is not likely to occur if a little escapes through the puncture in the vein.

Ligation.—Where Trendelenburg's test is positive in the type of case already referred to, in which the great saphenous venous trunk is chiefly affected, ligation of the termination of the trunk by fine silk or catgut suture is combined with injection of the outstanding varicose clusters. The descending thrombosis which follows the ligation greatly reduces the number of veins that require to be treated by injection, and the removal of the hydrostatic pressure from above renders the injections more effective. At the same time the advantages of an ambulatory form of treatment are preserved, since the ligation as well as the injection treatment is carried out under local analgesia. Emphasis has already been laid on the necessity for tying the internal saphenous vein at the saphenous opening above its highest tributary—that is, immediately before its termination in the femoral vein. It is also advisable, after ligating and dividing the vein between ligatures, to transfix the short segment of vein beyond each ligature and again tie the ligatures so as to make sure of their not slipping. This is particularly important in a patient who is allowed to walk about. It is as well not to transfix the upper segment of the vein proximal to the ligature lest thrombus form around the transfixion suture and extend into the femoral vein, where it may conceivably be detached and give rise to pulmonary embolism or infarction—a complication which we have fortunately never seen in connexion with the treatment discussed.

Excision.—The great majority of varicose veins can be satisfactorily treated either by injection alone or by injection with ligation; a small group remain which may require further ligations—for example, of the external saphenous vein, or a more distal ligature in the case of the internal saphenous in addition to the terminal ligature already described. Some few remain that are best treated by excision: such are cases of large isolated and distended knots occurring in young people and often apparently not directly connected with either saphenous system. These are comparatively rare.

Conclusion

With the great increase in the popularity of sclerosing solutions in recent times the more surgical methods of treatment have become somewhat neglected, but a study of the number of failures resulting from injection alone has shown that the best treatment of varicose veins is only occasionally injection, ligation, or excision, each practised as an independent measure. Most cases are best treated by a combination of injection and ligation.

Summary

The aetiology of varicose veins is surveyed, congenital and congestive influences being considered prominent factors.

Varicocele is a transient condition and should be treated conservatively.

Recurrences after treatment of the leg veins, and new varices incorrectly regarded as recurrences, are discussed.

It is contended that most cases are best treated by combined ligation and injection, particularly where Trendelenburg's test is positive.

The preparation and advantages of ethanolamine oleate solutions as sclerosing agents are discussed.

REFERENCE

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NERVOUS DISORDER AFTER INJURY

A REVIEW OF 400 CASES

BY

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A distinguished judge is reported recently to have stated that he regarded workmen's compensation as far and away the most difficult branch of the law, and he added that one of the chief difficulties in all these cases was traumatic neurasthenia. The medical aspect of the Workmen's Compensation Act presents many problems, particularly in the nomenclature and classification of the various functional nervous disorders which may be associated with injury. To label such disorders with the general heading "traumatic neurasthenia" is to ignore modern psychological approach and to stultify prognosis and treatment. One of the objects of this review is to call attention to the confusion which appears to exist in this respect and to put forward certain suggestions for classification. I write as a general physician who has been interested in such cases for the past twenty-five years, and not as a specialist in psychiatry.

There are two aspects of any injury. First, there is the surgical aspect, which deals with the anatomical disturbance caused by such injury, and its local effect: of the series under review 235, or 59 per cent., come into this category. Secondly, there is the result of the injury on the patient's nervous system. By this I do not imply organic injury to nerves, but a functional or psychogenic reaction which may lead to distortion or exaggeration of

the local effect and to other and more remote symptoms. In this series 165 cases, or 41 per cent., show such functional nervous disorder as a sequel to accident. Particularly in cases which reach a court of law, this latter manifestation is an important one. In fact, it is not infrequently the major issue before the court. Union may be perfect after a fractured thigh, but loss of morale may prevent a man from attempting to scale a ladder again. Let us suppose that two individuals, of approximately the same age and physique, sustain a similar injury. One of the two makes an uneventful recovery and is soon back at work; the other develops functional nervous symptoms which may entail lengthy litigation and prolonged absence from occupation.

Factors which Might Contribute to Functional Nervous Disorder

The 400 cases have all been examined by me within the last three years. They are taken seriatim from my case-books and have not been selected in any way. That is to say, the vast majority were referred to me solely because I was known to be interested in this type of medico-legal work and not because a physician's opinion was required in reference to the nervous system. Many of the cases showed some comparatively trivial injury, without any other disturbance whatever. I propose, with the help of full notes taken on each case at the time, to investigate certain aspects which might be supposed to have a bearing on functional nervous disorder after the initial injury.

(*a*) *Age.*—It might be thought that increasing age would lead to an increased tendency towards psychological sequelae. The job has perhaps been a monotonous one, followed conscientiously for many years until the individual is weary of it and his tissues are on the down grade. The accident might well provide a subconscious escape. I am quite sure that such mechanism does come into play at times. On the other hand it might be argued that in a younger person the shock of any accident, with an effect which may be maiming or disfiguring, might well be greater than in someone who is older. The actual figures show that the average age of the patient who shows no nervous sequelae is 39, whereas in those showing such disorder it is 41. There is no appreciable difference in these figures.

(*b*) *Sex.*—The first group, showing no psychological disorder, contains 69 per cent. of males and 31 per cent. of females. The second group, showing functional nervous disorder after the injury, contains 55 per cent. of males and 45 per cent. of females. This difference, 14 per cent., is not very great. (All percentages throughout this paper are given to the nearest decimal point.)

(*c*) *Severity of Injury.*—Does the severity of the injury bear any relation to subsequent psychological disorder? The cases in this series of 400 may be classified broadly as follows: fractures 113, amputations 18, concussions, 38, dislocations 7, contusions and sprains 112, sepsis (fingers, etc.) 14, cuts and abrasions 67, and a miscellaneous group (dermatitis, hernia, carbon monoxide poisoning, etc.) 31. Although it is obvious that there may be exceptions to the rule, it is safe to say that the average fracture is likely to be a more serious injury than the average contusion or sprain. Therefore I propose to take these two classes as representing respectively a more serious and a less serious type of injury. It will be noticed that the numbers in the two classes are approximately equal. Among the fracture cases 63 per cent. showed no functional nervous disorder, and in the remaining 37 per cent. functional nervous disorder was present. Among the contusions and sprains 46 per cent. showed no functional nervous disorder, and in the remaining 54 per cent. functional nervous disorder was present. The numbers in each series are too small to enable any far-reaching conclusion to be drawn, but the results certainly suggest that the severity of the injury does not predispose to subsequent development of functional nervous disorder.

The Psychological Factor

There must be some explanation for the fact that 41 per cent. of the cases in this series developed functional nervous disorder as a sequel to injury. But this apparently high figure becomes less surprising when we consider the incidence of functional (as opposed to organic) disease in ordinary medical practice at the present time. Sir Walter Langdon-Brown (1938) questioned various general practitioners as to what proportion of their patients suffered from functional rather than organic disease; not one of these doctors placed the figure at less than 40 per cent., while some put it as high as 75 per cent. Dunbar, Wolfe, and Rioch (1936) say that the figure ranges from 35 to 75 per cent., but they observe that this number must of necessity be arrived at on the basis of impression rather than of careful determination. Seeing that such a large proportion of ordinary illness is regarded as being of functional type, it is no wonder that the figure is also high when there is an added "psychosomatic interaction" associated with injury.

There seems no reason to doubt that in such cases the soil is ready for the seed; in other words, that some mental conflict or maladjustment to life was already present and that the injury acted as an exciting cause of the psychoneurotic symptoms which developed subsequently. Suggestion in such individuals is a potent factor. They are usually more prone to suggestion than are their more fortunate fellows who show no nervous phenomena. Autosuggestion may be rational or irrational. Fear may have been engendered at the moment of the accident and may persist after the actual effects of the accident might be expected to have worn off. Autosuggestion may perpetuate lack of function in a limb which has been injured. There may be a sense of resentment: the injured person feels that someone must be made to pay adequately for all that he has undergone. This is the basis of the German name "justice neurosis" for what we call "compensation neurosis." Even if the accident has been due to his own carelessness or negligence the mental mechanism of projection may come into play and enable him to fix the blame on to someone else. Then there is the ever-present fear that the accident has been or will be the cause of losing his place at work. This is a very real source of anxiety. An especially difficult case is that of the man who has been in temporary employment, which has now ceased automatically apart from his accident. In my experience such men are particularly liable to exaggerate their symptoms: in the circumstances there is a great temptation to do so. Suggestion by others is equally potent: the man's friends sympathize with his sufferings and tell him that he deserves ample remuneration; they may remind the patient of other workmen who have been similarly injured. An incautious remark from a doctor as to the apparent severity of the case may act as a powerful suggestion of this kind.

The individual's life develops along certain lines. In an environment which is as near to the ideal as possible

there is comparatively little stress and conflict, but such an environment is the exception rather than the rule, and the psychoneuroses of adult life result from early emotional conflicts. The individual who recovers from an injury with little or no psychic disorder as a sequel has presumably developed without much emotional disturbance, whereas the man who shows functional nervous sequelae is he in whom, as I have said, the soil is ready for the seed. Such a man will say, and will believe the statement to be perfectly true: "I was all right until the accident, and look at me now." As a matter of fact he was, from a psychological standpoint, far from all right before his injury; the latter has merely brought to light his pre-existing intrapsychic difficulties.

There is nothing new in the views expressed above. They were found to be true in connexion with the psychoneuroses which were seen in the war of 1914–18, and the work of the last twenty years has, in my opinion, confirmed them beyond all reasonable doubt.

Classification of the Neuroses following Injury

A psychoneurosis may be defined as a result arising from incomplete solution of a mental conflict. I suggest the following classification for the 165 cases in this series which showed functional nervous disorder:

(*a*) Post-concussion syndrome	.. 38 cases,	or 23 per cent.
(*b*) Hysteria	.. 102 ,,	,, 62 ,, ,,
(*c*) Neurasthenia	.. 16 ,,	,, 10 ,, ,,
(*d*) Anxiety state	.. 9 ,,	,, 5 ,, ,,

This classification is intended merely as a working basis for the elucidation of signs and symptoms and hence as a guide towards prognosis and treatment. In no sense is it meant to imply that the neuroses following injury can be fitted into four or more watertight compartments. Such an arrangement would not be feasible, because it is obvious that there may be considerable overlapping: an individual may show evidence of more than one of the above disorders.

For medico-legal work any attempted classification should be a straightforward one; each term which is used should be capable of clear definition and of explanation in simple language. It is better to avoid, if possible, the discussion of such matters as phobias, obsessions, and neuropathic inheritance. It will be noted that, with the exception of the post-concussion syndrome, which has an organic basis, the classification deals only with so-called functional disorders: space prevents me from touching upon such organic troubles as disseminated sclerosis or cerebral tumour following injury. Valuable information in this connexion can be found in a book by W. A. Brend (1938).

Post-concussion Syndrome

The word "concussion" is apt to be used loosely. Dorland defines cerebral concussion as "a condition caused by violent blows upon the head, attended with vertigo, loss of consciousness, nausea, weak pulse, and slow respiration." Professor Wilfred Trotter has defined concussion as "an essentially transient state due to head injury, which is of instantaneous onset, manifests widespread symptoms of a purely paralytic kind, does not as such comprise any evidence of structural cerebral injury, and is always followed by amnesia for the actual moment of the accident." It is very difficult at times to distinguish between a severe concussion and a (perhaps mild degree of) cerebral contusion or laceration. Indeed, there seems to be no reason why the conditions may not coexist. Purves-Stewart states that the post-concussion syndrome shows a characteristic group of chronic symptoms which may last for months or even years, and which are due to traumatic meningo-encephalitis with haemorrhages and minute lacerations of the brain or pia arachnoid. It is sometimes difficult in such cases to differentiate between primary psychological and secondary psychological and neurological sequelae. The post-concussion syndrome may show a large overlap in its symptomatology with the picture in an acute exacerbation of a chronic anxiety state—in fact, the clinical picture may be more that of an anxiety state, coloured by symptoms and signs of concussion, rather than the reverse.

Diagnosis.—The history of the accident points to concussion. The most important symptom is headache, which usually comes on when the patient gets up in the morning, and which is made worse by postural changes or by coughing. The memory as a rule is unimpaired, but there is usually some degree of mental inertia and lack of power of concentration. The patient is generally oversensitive to loud sounds and bright lights: dizziness is a common symptom, and there may be some change in personality, with irritability and emotionalism. Such patients are intolerant to alcohol: a much smaller dose than usual tends to produce intoxication. Tremors are frequent; sleep is apt to be disturbed.

Example.—Mrs. A., aged 52, housewife, was a passenger in a saloon motor-car which was involved in a collision with another vehicle. She remembered nothing of the accident, and regained consciousness after admission to hospital, where a diagnosis of cerebral concussion was made. *X*-ray examination of the skull showed no evidence of fracture. When seen six months after the accident she was complaining of headache and of dizziness, occurring chiefly when she changed her position. Apart from a scar on the chin there were no signs of injury. She was found to be unsteady if she made any sudden movement or if she stood with the eyes closed. No evidence of any organic lesion of the nervous system could be elicited by examination.

Hysteria

The word "hysteria" is capable of two interpretations. There is the popular conception, which implies a blend of imaginary symptoms with an early Victorian atmosphere of "the vapours": hence there may be a faint stigma attached to the word. "Traumatic neurasthenia" sounds much more imposing and face-saving, even if it is entirely incorrect as a diagnosis. Dorland defines hysteria as "a disease characterized by lack of control over acts and emotions, by morbid self-consciousness, by exaggeration of the effect of sensory impressions, and by simulation of various disorders." Two chief varieties of hysteria are recognized by psychologists—conversion hysteria and anxiety hysteria. The definition given above is really that of the latter disorder. Conversion hysteria, when it shows *belle indifférence* to the symptom, does not fit easily into this definition. The absence of open emotion is the main pitfall in diagnosis from the physician's point of view. Without going into the many theories which have been put forward in explanation of this condition—the names of Freud, Janet, and Babinski are associated with these—it may be sufficient to say that hysteria is characterized by heightened suggestibility, and as suggestion plays a considerable part in the sequelae of an injury it is not surprising that hysteria is one of the commonest varieties of functional nervous disorders after such injury.

Diagnosis.—The patient becomes egocentric; he craves for sympathy either openly or by more devious ways; he is introspective and his emotional control tends to be enfeebled. There may be aphasia, aphonia, anosmia,

alleged defects of vision, and excessive volubility. Hysterical pains may be referred to any part of the body: headache, particularly in the occipital region, is common, as is spinal pain and limited movement, especially following local trauma in this region. Passive movement may be resisted strenuously and may be accompanied by emotional deep breathing. Clonic spasms or tremors may affect one limb only, which would be an unusual manifestation in organic disease; hysterical paralysis may be flaccid or accompanied by contracture. Tachycardia with precordial discomfort, in the absence of evidence of organic heart disease after adequate investigation, is a common symptom. Other manifestations are rapid breathing, cough (again without discoverable reasons for it), aerophagy, dysphagia, globus hystericus, vomiting, anorexia, meteorism, constipation, diarrhoea, and pyrexia. Tendon reflexes tend to be normal or exaggerated, and during their elicitation the patient may complain of great discomfort. The tendon reflexes are never lost in pure hysteria (Purves-Stewart). The plantar response is flexor in type. Although the nature of the symptoms may be highly suggestive of a hysterical origin, every care should be taken to exclude organic disease. For this purpose clinical observation and experience are the essentials; valuable confirmatory evidence can be obtained from electrical reactions, radiology, biochemistry, and other ancillary sources.

Example.—A man aged 52, shop assistant, while walking on the pavement, was struck in the back by a motor lorry; he did not lose consciousness, and continued his journey by tram-car. There was some bruising of the back but no *x*-ray evidence of injury. Almost immediately after his accident he began to have attacks of palpitation on slight exertion or excitement. When seen three months after the accident no residual effects of the injury could be detected, but the patient was worried by wondering if the heart condition had resulted from the accident and if the former were serious. The heart was examined clinically, electrocardiographically, and by means of Master's staircase test, and its condition was found to be entirely normal. The tachycardia was evidently of nervous origin, following his minor accident.

Neurasthenia

Dorland's definition of neurasthenia is "nervous prostration; a nervous disorder characterized by abnormal fatigability." I do not think that modern psychology would quarrel with this definition. Predisposing factors may be sexual excesses, prolonged mental or physical overstrain, and toxic foci. Eye-strain may be present. Some of these cases may be in reality severe anxiety states in which the energy of the individual is used up in suppression and repression. Other cases, diagnosed as neurasthenia in the first instance, prove on fuller investigation to be anxiety states in shut-in and schizoid personality types. In these the prognosis is correspondingly poor. From the figures which have been given above it will be seen that true neurasthenia is a comparatively rare functional nervous disorder after injury.

Diagnosis.—The cardinal feature is undue fatigability. The patient is too tired to make any exertion; sometimes too fatigued even to eat in a normal manner. There is lack of concentration power; the memory is unimpaired and the patient relates his woes at great length; he is usually full of aches and pains, and he may be depressed and emotional. On the physical side the blood pressure is usually low, and there may be a wide difference in the pulse rate when the patient is standing up and when he is lying down. Transient blotches of redness on the sides of the neck are common. Abdominal discomfort is frequent. The reflexes are generally lively; the knee-jerk tends to be brisk.

Example.—Mrs. B., aged 47, housewife, was involved in a collision when travelling as a passenger in a motor-car. She sustained superficial cuts and bruising, but there was no *x*-ray evidence of fracture. When she was examined six weeks after the accident she complained that her nerves were upset and that her thighs would not support her when she rose from a sitting position; she felt shaky after standing for a few moments, and was quite unable to do more than a small portion of her household duties. She was depressed and emotional, and spoke at great length of her lack of energy and power for work. An obvious potential focus of infection was the presence of many decayed teeth in the lower jaw. Beyond two small scars on the forehead and nose, no evidence of injury was found. There was tremor of the outstretched arms and of the closed eyelids.

Anxiety State

In this manifestation the patient shows paroxysms of terror and emotional anguish. The condition is thought to be due to repression of antecedent emotional strain in a neuropathic temperament.

Diagnosis.—In addition to the emotional paroxysms which have been mentioned, the patient complains of broken sleep and of nightmares, in which scenes of terror are revived; these may be particularly associated with the accident. Tremors and palpitation are usual.

Example.—A man aged 62, labourer, was kicked in the testicle by a bullock and was in bed for six weeks following the injury. Before this incident he had had no illness and had been following his occupation in apparently good health. When examined about three months after the accident the left testicle was found to be enlarged and tender, and the condition was considered to be a haematocele; this was apparently improving steadily. He had been married for the second time six months before his injury. He was in a state of extreme depression, complaining of broken sleep, general nervousness, and attacks of fainting, with shooting pains across the shoulders. He hinted that he had contemplated suicide. His blood pressure was 250/175; there was tremor of the tongue, the closed eyelids, and the outstretched arms. Treatment by a psychiatrist at a clinic was advised. He has improved a little, but is now (nearly two years after his accident) still unfit for work on account of his nervous condition.

Before leaving this section I should like to say that in my opinion true malingering is rare in compensation cases. There may be a mild degree of "lead-swinging" in certain individuals, but deliberate attempts at deception appear to me to be infrequent. The term "compensation neurosis" is one which I dislike—to me it implies a suggestion of malingering for purposes of gain. While it may be true that a man is quite willing, or even rather overwilling, to make the most of his disability in certain circumstances, I consider that a suggestion of compensation neurosis is not often justifiable. A word must be said with regard to "brooding," a condition which is recognized in law in that it may cause incapacity for work and may not necessarily be the result of the accident.

Prognosis

Prognosis—the future outlook—is the crux of the medico-legal problem in compensation cases. In order that it may arrive at a just decision, the court expects medical witnesses to give a careful and reasoned opinion as to the individual's prospects of future health and usefulness.

In post-concussion syndrome the headache may last for months or even years. In my view it is unwise to

express any definite opinion as to the length of time during which the headache may persist. Brend gives it as his experience that the symptoms usually clear up in a few months to a year, and that if they are prolonged much beyond that period investigation will probably show that the symptoms are being maintained by other factors. It does not follow that an individual is unfit for any work because there is still a complaint of headache. In hysteria the prognosis is favourable if the principles of treatment are thoroughly understood, because the heightened suggestibility of the individual can be utilized to suggest improvement and cure. In my opinion the prognosis in this class of case is better than in either of the other three classes. Each case must be considered on its merits as regards the length of time that is likely to elapse before relief can be expected. In neurasthenia and anxiety neurosis the prognosis after injury is not quite so favourable: more time and more patience are usually needed, though the ultimate result is often satisfactory.

Treatment

Before discussing the treatment of functional nervous disorders after injury it is advisable to refer briefly to certain factors which may help to prevent the development of such disorders. At Blackburn Royal Infirmary we have a most efficient fracture clinic, and the personality of the surgeons who are in charge goes a long way towards preventing the development of psychoneuroses. The establishment of a complete service of such fracture clinics throughout the country, each one under the control of a surgeon who will take into consideration the patient as a whole and not confine his attention solely to the injury, will help to lessen nervous sequelae. Optimism to a justifiable extent, openly expressed, rather than silence and an implied or stated pessimism, should be the rule. The patient's own medical adviser should adopt this attitude, and even the doctor who examines the case when litigation is pending can at times be a help to the patient in this respect.

In the treatment of cerebral concussion the patient should rest in bed for at least a fortnight after the injury, even in the mildest case. Physical and mental rest play an important part in the treatment of post-concussion syndrome, which is probably related, in fact, to manifest pathological changes. Hysteria, neurasthenia, and anxiety neurosis may all require a certain degree of mental exploration—a term which is tending to supplant the misuse of the term "psycho-analysis"—in the course of their treatment, followed by persuasion and suggestion. In my opinion the best method of treating such cases is to admit them to a general hospital under the care of a physician who is interested in psychology. Here the case can be investigated thoroughly from every angle, physical and psychical. I think it is better to have these cases in a general ward; if they are segregated with psychoneurotics there is a tendency to compare notes, and the result is not always favourable. The more severe type of case may require mental exploration by an expert.

Is the financial settlement of a claim useful as an auxiliary method of treatment, so to speak? I think that it would be safe to say that it often helps in this direction, and in some instances the results are dramatic. I have in mind one case which resembled the worst type of post-war neurosis—general tremors which literally shook the floor when the patient was sitting in a chair, and a painfully evident emotionalism. The outlook with reference to ultimate fitness for work seemed bad in this case. The man received several hundreds of pounds in compensation: whether *post hoc* or *propter hoc*, he was back at full work within twelve months. A financial settlement places the responsibility for recovery on to the patient himself. Suitable light work may undoubtedly have a beneficial effect in assisting recovery in certain cases, by taking a man's mind off his injury and by making him feel that he is beginning to be worth while once again: this applies especially to cases in which depression is an outstanding feature. Finally, it might be argued that lack of sympathy and understanding (which must be distinguished from "spoiling") by employers, relatives, and doctors may be one of the main factors in producing post-traumatic psychological disorders. Whether this be true or not, it is at least incumbent upon us as doctors, in treating such cases, to let the patient see that we accord full recognition to his symptoms, even where they are of emotional origin.

The Legal Aspect

Before concluding I should like to deal with certain points in compensation cases which are not, strictly speaking, relevant to the title of the paper, but which may not be out of place. It is hardly necessary to stress the fact that any medical report which is asked for by a solicitor or insurance company, in a compensation case, may form the basis for a searching cross-examination by counsel in subsequent legal proceedings. Therefore such reports should be drawn up with the utmost care and no word should be used without due thought. A full history of the medical aspect of the case should be taken, but it is no part of the duty of a medical examiner to inquire into purely legal points—for example, as to the relative position of two vehicles which have collided. The patient's account of all his symptoms should be noted in full, and any dates and times should be as accurate as possible. During this account a preliminary impression of the patient is often formed by an experienced examiner. Apart from a detailed description of his injuries, it is essential to make a thorough general examination of the patient: the importance of finding, for example, sugar in the urine need only be mentioned to be appreciated. Further, the patient's expectation of life, so far as this can reasonably be estimated, may be of considerable moment in the case.

After the report has been furnished it is quite probable that the writer of it may have to give evidence in court in support of his opinion. If a technical expression must be used, an explanation should be added. After an experience of a quarter of a century, I should like to pay a warm tribute to Bench and Bar for the manner in which compensation cases are conducted; many of such cases are complicated and highly technical, and I have always been impressed with the patience, thoroughness, and complete impartiality which are shown throughout. It is the part of a medical witness to help the court in arriving at a just decision. A doctor should never be an advocate in the case. It is his business to give an unbiased account of his findings and to avoid a tendency to take sides. This is not to say that he may not have strong opinions in one direction as a result of his investigation of the case. But he should always be willing to concede any point in cross-examination when he can do so truthfully and conscientiously. Nothing is gained by an obstinacy which comes perilously near to advocacy. Judge and counsel see through evidence of this type immediately, and it may even tend to discredit the value of the remainder of the witness's statements. The criterion

which one may well adopt is this: Could I make that assertion before a board of medical examiners if my qualifying diploma depended upon it? Viewed from this standpoint, I am afraid that I should have been forced to plough a medical witness occasionally if I had been one of the examiners. When expressing an opinion in the witness-box the word "probable" should be used in preference to "possible." Almost anything is possible, but the court wishes for information on reasonable probability.

Evidence should be given in a voice which can be heard. In the county of Lancaster a speaker, to be considered adequate, must "stand up, speak up, and then shut up," and the same principle should apply to the courts. A witness must perforce stand up (unless prevented by physical disability), and he should certainly speak up. I have seen a calm court change quickly into a life-like representation of William Henley's "place of wrath and tears" because a medical witness would insist on muttering unintelligible technicalities in an inaudible tone. If we have anything to say which is worth hearing, let it be heard. The third point in the adequate speech—namely, a knowledge of when to stop—is equally important. In other words, simple affirmative or negative replies to questions are desirable whenever possible, though at times it is necessary to add some such words as these: "I should, however, like to qualify this by saying. . . ." Any witness who makes a long and rambling reply to a question is laying up trouble for himself and his case.

I think that no one will deny that there is a psychological background for the nervous disorders which may follow injury. Can we, as medical witnesses, hope to make such an approach intelligible in plain language when we are giving evidence? I can imagine the most urbane of His Majesty's judges dealing forcefully with a doctor who attempted to harangue the court on the relative merits of various schools of thought in psychology. But it is surely possible to explain that the mental make-up of the individual, and the influences which have been active since his earliest days, have had an effect on his outlook as regards his injury. Such a statement could only be regarded as sound common sense, but the viewpoint is one which has been in the past, and frequently still is, insufficiently stressed.

Summary

A series of 400 compensation cases is reviewed, and the proportion of those in which functional nervous disorder developed subsequently is given.

Factors in the causation of these disorders are discussed, and a classification of such disorders is put forward.

Views are expressed on prognosis and treatment in these cases.

The paper refers, in conclusion, to the legal aspect from the standpoint of the medical witness.

I wish to acknowledge with gratitude my indebtedness to Sir James Purves-Stewart's well-known book, *The Diagnosis of Nervous Diseases*, from which many quotations have been made in this paper.

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THE STRUCTURE AND FUNCTIONS OF SYNOVIAL MEMBRANE AND ARTICULAR CARTILAGE*

BY

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John Hunter taught us the need for accurate anatomical and physiological knowledge as a basis for the rational treatment of injury and disease. The result of neglect of this principle is demonstrated by the present unsatisfactory position relating to rheumatic diseases, particularly as they affect the joints. It has been estimated that in the United Kingdom alone there are more than a million adults and more than 200,000 children who are suffering from rheumatic disease, both articular and non-articular, and it is probable that this number exceeds the combined total of those suffering from heart disease, tuberculosis, and cancer. These disturbing facts should stimulate further interest in the neglected subject of the anatomy and physiology of joints and of other structures liable to be attacked by rheumatism. In fact, we must replace the shifting sands upon which much of our treatment of rheumatism is at present based by a firmer foundation built upon Hunterian principles. Such principles are also of vital importance in the treatment of injuries of joints, if prolonged or even permanent disability is to be avoided and the menace of unqualified practice in this sphere removed.

It is impossible within the scope of a short paper to deal adequately with such a large subject, and as a basis of discussion I propose to discuss these problems under two principal headings: (*a*) the structure and functions of synovial membrane; (*b*) the structure and functions of articular cartilage.

Structure and Functions of Synovial Membrane

During the development of a diarthrodial joint a splitting of the undifferentiated mesenchyme occurs, the central part becoming the articular cartilages and interarticular fibrocartilages when present, and the lateral portion the synovial membrane, capsule, and its accessory ligaments. This mesenchymatous origin of the different elements of the joint explains the readiness with which under certain conditions, as in osteo-arthritis, cartilage and bone develop in the synovial membrane, or with which the articular cartilage and interarticular cartilages may be transformed into connective tissue or bone. It was formerly considered that the synovial membrane of a joint forms a closed sac which completely covers the inner surface of the capsule and the surfaces of the articular cartilages. It is now established, however, that the synovial membrane resembles rather a sleeve with two surfaces and two circumferences, the latter being attached to the margins of the articular cartilages, where, to the naked eye, they appear to end. Microscopically, however, the synovial membrane can be traced for a short distance over the extreme lateral part of the articular cartilage. In the same manner, such intra-articular fibrocartilages as the semilunar cartilages in the knee-joint are not completely clothed by synovial membrane, as was at one time thought, for the membrane strays for a short distance

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only over the peripheral portions. I have endeavoured to demonstrate that this relation of the synovial membrane to the articular cartilage explains much that has hitherto been obscure in the pathology of osteo-arthritis, and that the relation of the membrane to the semilunar cartilages of the knee-joint is of great importance in regard to injuries of the menisci and their treatment.

Structure

A typical synovial membrane consists of an outer layer of lax connective tissue continuous with the joint capsule, and an inner layer which is in the main smooth and shining like such serous membranes as the pleura or pericardium. Near the articular margins the membrane is studded with villi, which are enlarged and more numerous in many forms of synovitis or arthritis. This arrangement of the villi enables their secretion to be readily available to minimize articular friction.

The Non-villous Portion.—The structure of this part is by no means uniform. In those areas where the membrane is not subjected to much friction it is composed of a layer of flattened connective-tissue cells which form an endothelium-like surface, although neither in origin nor in structure are they true endothelial cells, as formerly considered. This layer of flattened cells rests upon one of lax connective tissue of areolar type containing both lymphatic and capillary plexuses, and between these layers a certain amount of gliding movement is possible. I pointed out the connective-tissue nature of this superficial non-villous layer in 1922, and among those who subsequently confirmed this observation were Key, Sabrazès, and Franceschini. The last-named has given the name "reticulo-endothelial" to this and also to the villous area of the synovial membrane, and considers that these portions possess the same functions as the reticulo-endothelial system possesses elsewhere. He does not believe that the underlying lymphatics have any *direct* connexion with the articular cavity. Where the non-villous area of the synovial membrane is subjected to friction—as, for instance, where it covers the deep surface of the tendon of the quadriceps extensor in the knee-joint—the above-mentioned endothelium-like layer is absent and is replaced by a collagenous layer, the fibrils of which run parallel to the underlying tendon. In this collagenous layer are embedded connective-tissue cells which also lie parallel to the surface. This portion of the synovial membrane contains comparatively few blood vessels.

The Villous Portion.—The villi are invested by rounded or oval cells of the connective-tissue type with prominent spherical or oval nuclei. In the stem of the villus these cells are disposed in a single layer, but near the extremity they lie in three or four layers, especially when there is a condition of synovitis. The function of these cells is the secretion of synovia. In 1922 I found that, on staining synovial villi with carbol-thionin, globules of mucin could be demonstrated in these synovial cells together with the granules from which they were derived. These were independently described by Mayeda at the same time and subsequently confirmed by Sabrazès and Kling. Certain fatty processes that project into joint cavities, such as the infrapatellar pad of fat in the knee-joint, are so richly supplied with synovial cells that the name "synovial glands" given to these processes by Clopton Havers receives histological justification. The mechanical pressure of the joint movement upon these processes expels the mucin from the synovial cells into the cavity of the joint.

Regeneration of Synovial Membrane.—It has been found that if large areas of the synovial membrane are removed in experimental animals or by operation in human beings a new membrane is formed by metaplasia of the cells of the subsynovial tissues that is indistinguishable from that normally present. A similar phenomenon is observed in false joints.

Synovial Fluid

Many problems concerning the synovial fluid are still obscure, and further research is needed to rectify the gaps in our knowledge. Opinions differ concerning whether it is a transudate, a secretion, or a product of disintegration. It is probable that all these factors play a part in its production.

Normal Composition.—Analysis of human synovial fluid from a personal series of cases showed that the total solids averaged 4.41 per cent., of which the protein content averaged 1.6 per cent. and the mucin content 1.95 per cent. It has been estimated that the protein content of the lymph in the thoracic duct varies from 3.5 to 4.3 per cent. and that of the lymph from the limbs is 2.4 per cent. It seems clear from these analyses not only that synovial fluid contains a high percentage of mucin but that the protein content is lower than that of the lymph. Does not this show that the principal function of the synovial fluid is that of a lubricant by virtue of the secretion of mucin by specialized synovial cells, and that the part it plays in nutrition by transudation of lymph from the subsynovial capillaries is comparatively unimportant? I propose to revert to the element of disintegration later when discussing the articular cartilage.

Experimental Work upon Absorption from Articular Cavities

Space will permit only a cursory examination of this problem. Diffusible substances pass readily from the blood to the synovial fluid, and vice versa. Cajori, Pemberton, and others have shown, for instance, that it is possible to detect glucose in the synovial fluid half an hour after oral administration, and Key has shown that diffusible dyes such as trypan-blue, when injected intravenously in rabbits, rapidly stain the synovial fluid. The actual mode of absorption from the joint cavity is still undecided, and more certain knowledge is long overdue. It has been shown by Le Gros Clark that when trypan-blue is injected into a joint the particles are taken up by the synovial cells, which then migrate into the subsynovial layer. No appreciable absorption took place until twelve hours had elapsed, and he argued that the synovial membrane formed a closed sac and that there could be no question of loose connective-tissue spaces abutting upon the joint cavity. It seems highly probable that the synovial cells are able to deal in this manner with foreign particles.

In my own experiments I found that absorption of isotonic solutions or diffusible dyes took place rapidly, and I endeavoured to show that such absorption was mainly by the subsynovial capillaries. Colloidal dyes of greater molecular composition which approximate more closely to the synovial fluid were absorbed more slowly by the subsynovial lymphatics. *It was found that in both types absorption took place more rapidly when movements of the joint of the experimental animal were permitted.* Early movement in injuries and diseases of joints associated with a plastic synovial exudate would appear, therefore, to be the best way of avoiding adhesion formation and prolonged disability. The rapidity with which substances pass from the blood to the synovial fluid, and vice versa, seems to indicate that the synovial membrane

is not a completely closed sac and that there is ready access in certain areas to the lymphatics and capillaries.

The Structure and Functions of Articular Cartilage

The problems of the aetiology and pathology of arthritis, particularly of the osteo-arthritic type, are intimately connected with the structure and function of articular cartilage. This tissue is, as we have seen, of mesenchymatous origin and is well adapted for the functions it performs. When in health, it has a smooth surface which is lubricated by the synovial fluid, whereby friction is reduced to a minimum. It is of great strength and resiliency, and thus serves to protect the subjacent bone.

I shall endeavour to make clear that there are important differences in structure and function between the central and lateral areas of articular cartilage, and that these fundamental facts afford a simple explanation of much that was previously puzzling and obscure in osteo-arthritis. From the systematic examination of sections of articular cartilage at different ages it has been found that degenerative changes begin there at a much earlier age than was hitherto supposed. These age-changes in the tissues of the body, starting as they do often at different periods of life, are of great anatomical, physiological, and pathological interest. I was able to show by systematic post-mortem examination of a large number of joints that in over 90 per cent. of all persons between 60 and 70 fibrillation of the central articular area visible to the naked eye was present, and Bauer and Bennett have since demonstrated by microscopical investigation that degeneration of this central zone actually begins in the third decade of life.

Central Area of Articular Cartilage

If the actual surface of this area be examined microscopically it will be seen that it is constituted by a well-defined and clear-cut margin which is devoid of any cell covering or perichondrium and is evidently formed of collagenous matrix. A delicate layer of cells constituting a perichondrium has been described by some previous workers, but I have not been able to confirm this in normal adult articular cartilage, although it unquestionably exists at an early stage of development. In this superficial stratum of the articular cartilage, and embedded in the matrix, can be seen a few layers of flattened cartilage cells arranged in groups of two to four cells which lie parallel to the surface. A point which I wish to emphasize is that the cartilage cells near the surface show no sign of degeneracy. In the intermediate zone of the articular cartilage the groups of cells are more irregularly disposed, and in the deeper zone the cells are arranged vertically. Where the deeper portion of the matrix lies upon the subarticular layer of bone it is infiltrated by a deposit of lime salts.

The usually accepted view of the structure and function of articular cartilage is based upon the teaching of Ogston. He maintained that articular cartilage is continually renewing itself from a focus of *central* growth, and that it develops in the direction of the joint an effete layer which is worn away by the joint movements and participates in the formation of the synovial fluid. He further maintained that the cells in the deeper zone, also formed from this focus of central growth, fulfilled the function of reproducing the subarticular layer of bone. It is difficult to believe that Ogston's investigations were carried out upon normal articular cartilage. It seems clear that instead of being degenerate the superficial cells of the articular cartilage are the source from which the deeper cells are derived, and that they are analogous to the superficial cells of the lateral portion of the articular cartilage or to the perichondrial cells of other varieties of hyaline cartilage. It is probable, however, that a certain amount of disintegration of the superficial collagenous layer may occur and contribute to a slight degree to the synovial fluid.

It appears to be the case that the deeper layer of cartilage cells are in fact dying cells, and a slow process of absorption of these cells takes place by vascular inroads containing chondroclasts from the subjacent bone. This process is very greatly increased in osteo-arthritis.

Lateral Area of Articular Cartilage

This area resembles those varieties of hyaline cartilage, such as costal cartilage, which are furnished with a perichondrium, for its surface is covered by a delicate extension of the synovial membrane. When traced centrewards, the connective tissue is reduced to a single layer of close-set endothelial cells; these subsequently produce hyaline matrix, in which they become buried, so that the more central parts of the articular cartilage, as we have seen, exist at the free surface of matrix. At the edge the articular cartilage becomes greatly fibrillated and merges into fibrous tissue, beyond which it is furnished with capillaries derived from the circulus articuli vasculosus. In the thin synovial layer upon the surface lie capillaries derived from the circulus, and blood vessels can also be traced from the subarticular layer of bone into the deeper layer of this part of the cartilage. It is important, therefore, to bear in mind that this lateral portion of the articular cartilage is far better nourished than the central portion. This fact has a most important bearing upon the joint changes that occur in osteo-arthritis.

This difference in structure of the central and lateral portions of the articular cartilage is capable of explanation on developmental grounds, and a study of comparative anatomy is instructive because it shows that certain animals preserve, throughout life, the stages that characterize human articular cartilage at early developmental stages.

Nutrition of Articular Cartilage

According to William Hunter articular cartilage derives its principal nutrition from the circulus articuli vasculosus. Toynbee assigned to the subarticular vessels the most important role. Some workers, including Strangeways, have argued that the synovial fluid plays an important part in nourishing the cartilage, pointing to the continued growth of loose bodies composed of cartilage. However, there can be no doubt that the presence of a loose body is associated with synovitis with a synovial fluid enriched by inflammatory exudate. The analyses of normal synovial fluid mentioned above reveal such a low percentage of albumin that there can be little doubt that the nutritional role of synovial fluid is of minor importance. I have observed that an injection of carmine and gelatin into the circulation readily permeates the subarticular osseous layer and that, not infrequently, blood vessels can be traced through this layer into the deeper layers of the articular cartilage.

To summarize, it appears probable that the principal source of nutrition of articular cartilage is the circulus articuli vasculosus, and that this is supplemented (*a*) by the synovial fluid, which assists in nourishing the super-

ficial and more central zone, and (*b*) by the subarticular vessels, which assist in nourishing the deeper zone.

How does the nutrient fluid gain access to the cartilage cells? No lymphatics have ever been demonstrated in articular cartilage. If, however, a section be examined that has been stained by carbol-thionin, which stains mucin pink, it will be seen that the zone of matrix immediately surrounding the cell groups is clearly mucinous and the most recently formed portion. It will be found that these pink or mucinous zones branch, intercommunicate, and form a sponge-like structure around the meshes of which lie the older or collagenous portions of the matrix, and it is probable that the cartilage is nourished by plasma that percolates along this mucinous network.

Repair in Articular Cartilage

As the central and superficial area of the articular cartilage is nourished principally by the synovial fluid, which, as we have seen, has a low protein content, and the lateral areas are nourished by the circulus articuli vasculosus, it is not surprising to find a difference in the response of these different zones to both injury and disease. To ascertain this I performed a series of experiments. In the first, incisions were made in the central and lateral areas of the articular cartilage in rabbits. The findings of Redfern were confirmed—namely, that incisions in the central portion remained unhealed for long periods, and that if repair took place eventually the bond of union was of connective tissue derived from a feeble proliferation of the cartilage cells at the margin of the incision. Incisions in the lateral portions, however, healed more rapidly, and there was a new formation of cartilage by active proliferation of the cartilage cells in which the perichondrium participated.

Experimental Production of Osteo-arthritis

In a further series of experiments it was found that removal of the central poorly nourished area of the articular cartilage was followed by compensatory proliferation of the lateral better-nourished areas, and I am of the opinion that the chondro-osteophytes, which are such a prominent feature in osteo-arthritis, are often due to compensatory proliferation of the lateral articular areas after destruction by injury or disease of the central areas. In arthritis arising from toxins it is possible that those toxins that cause destruction of the poorly nourished areas may bring about proliferation of the better-nourished lateral zones.

It is clear that an urgent need exists for further research into the neglected subject of the anatomy and physiology of joints.

Summary

The structure and functions of synovial membrane and of articular cartilage are discussed in their relation to the treatment of rheumatism and injuries to joints.

The relation of synovial membrane to articular cartilage is explained.

The result of an analysis of synovial fluid is given and its principal function discussed.

A brief examination of the problem of absorption from articular cavities is made.

Differences in structure and function between central and lateral areas of articular cartilage are reviewed in their bearing on osteo-arthritis.

The source of the nutrition of articular cartilage is discussed, together with the manner of repair.

THE RELATION OF THE ANTERIOR PITUITARY GLAND TO CARBOHYDRATE METABOLISM*

BY

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Since the first clinical observations were made concerning the frequency with which glycosuria occurs in cases of pituitary tumour (Loeb, 1884) much experimental evidence has accumulated to show that the pituitary gland plays an important part in the control of carbohydrate metabolism. The early experimental investigations (Borchardt, 1908; Cushing, 1912) stressed the significance of the posterior pituitary lobe in this connexion, but the fundamentally important researches of B. A. Houssay and his collaborators have now turned our attention to the anterior lobe of the pituitary gland. Although the possibility cannot be entirely ruled out that secretions of the posterior lobe influence carbohydrate metabolism, at present the anterior portion of the pituitary gland is believed to be of greater significance in this respect. The evidence for this belief emerged in a striking manner from the investigations of Houssay and his colleagues.

In 1924 Houssay and Magenta found that dogs from which the pituitary gland had been removed were excessively sensitive to the toxic action of insulin. In agreement with the prevailing views, this increase in sensitivity to the action of insulin was believed to be due to removal of the posterior portion rather than to removal of the anterior lobe of the hypophysis, an assumption which was apparently supported by the findings of Geiling, Campbell, and Ishikawa (1927).

In the toad removal of the pars glandularis of the pituitary gland (corresponding with the anterior lobe in mammals, although it is somewhat posterior in this species) can be effected with greater ease than in mammals, and Houssay and Potick (1929) investigated the influence of the removal of the whole pituitary gland, and of the pars glandularis only, on the insulin sensitivity of the toad. They were surprised to find that extirpation of the pars glandularis alone greatly increased the sensitivity of the animal to insulin, and that subcutaneous daily grafts of toad pars glandularis counteracted this excessive sensitivity of the hypophysectomized toad to the hypoglycaemic action of insulin, although similar grafts of tissue from pars nervosa (including tissue from pars intermedia) were ineffective. These experiments demonstrated that the pars glandularis was that part of the pituitary gland largely or solely concerned with the regulation of the sensitivity of the toad to the hypoglycaemic action of insulin. Similar results have more recently been obtained with mammals (Pencharz, Cori, and Russell, 1936; Swann and Fitzgerald, 1938), and it is now concluded that in all species the secretions of the anterior lobe, rather than those of the posterior lobe, are of importance in the regulation of insulin sensitivity.

If, as demonstrated by Houssay and Potick, the secretions of the pituitary gland are active in inhibiting the action of insulin, then it might be expected that removal of this gland would diminish the intensity of a diabetic condition. Houssay and Biasotti (1930) found that in the

* Read in opening a discussion in the Section of Physiology and Biochemistry at the Annual Meeting of the British Medical Association, Aberdeen, 1939.

toad, if the whole pituitary gland, or the pars glandularis only, were removed, subsequent pancreatectomy did not provoke the usual glycosuria and the blood-sugar level was never more than slightly raised. In dogs also hypophysectomy was found to reduce the severity of the diabetic condition which normally follows removal of the pancreas, and hypophysectomized-depancreatized dogs often survived for a much longer time than did animals from which the pancreas alone had been extirpated.

These experiments showed that the influence of the pituitary gland on carbohydrate metabolism was that of intensifying those processes which, taken to excess, lead to diabetes. It was therefore to be expected that the administration of pituitary extracts to hypophysectomized-depancreatized animals would intensify their diabetic condition, and that the administration of such extracts to normal animals might induce the appearance of the symptoms of diabetes. Both of these expectations were realized in practice, although Houssay and his colleagues were forestalled in the demonstration of the diabetogenic action of pituitary extracts in normal animals by the publications of Evans *et al.* (1932) and of Baumann and Marine (1932). In all these experiments a truly diabetogenic action of anterior pituitary extracts was demonstrable, although extracts of the posterior lobe were relatively or completely ineffective. It was therefore assumed that in the depancreatized animal the diabetic condition was brought to its normal degree of intensity under the influence of the secretions of the anterior lobe.

It is now recognized that removal of the pituitary gland results in a number of different effects on carbohydrate metabolism, and that in many instances such effects can be diminished or abolished by the administration of suitable anterior lobe extracts. In these instances the influence of the removal of the whole pituitary gland is presumed to be due to the removal of the anterior lobe alone.

Although many of the effects on carbohydrate metabolism of hypophysectomy and of the administration of anterior pituitary extracts are undoubtedly intimately related, it is convenient to discuss a number of them under separate headings.

The Pituitary Gland and Insulin Sensitivity

In the hypophysectomized rabbit 0.1 unit of insulin may reduce the blood sugar to a level which follows the administration of 2 units of insulin to the normal rabbit. The administration of an anterior pituitary extract some hours before the insulin is injected can diminish or almost abolish the hypoglycaemic effectiveness of insulin in both normal and hypophysectomized animals. The active principle, which has been named the "glycotrophic" substance, is not diabetogenic *per se*; insensitivity to the hypoglycaemic action of insulin may be induced in animals in which the fasting blood-sugar level is not significantly raised (Young, 1936, 1938).

Glycogen Storage

When a hypophysectomized animal fasts the blood-sugar level falls and hypoglycaemic crises may develop; at the same time the glycogen stores are found to be depleted. Russell and others have shown that in the hypophysectomized rat the fasting R.Q. is abnormally high, and the rapid disappearance of the glycogen stores is apparently due to an abnormally high rate of carbohydrate oxidation in the muscles of these animals (Fisher, Russell, and Cori, 1936). The administration of anterior pituitary extract during fasting can prevent the abnormal depletion of the muscle glycogen stores of the hypophysectomized animal; the active principle has been named the "glycostatic" substance (Russell and Bennett, 1936). From the recent experiments of Long, Russell, Bennett, and others it appears probable that the secretions of the anterior pituitary gland exert two different types of action on the glycogen stores: (1) an action directly on the muscles to depress the rate of carbohydrate oxidation (glycostatic substance); (2) another action by way of the adrenal cortex, stimulating glycogen formation from protein in the liver (adrenocorticotrophic substance?). The second type of action can also be exerted by crystalline adrenocortical substances (Long and Katzin, 1938).

Russell (1938) has shown that when hypophysectomized rats ingest glucose a greater proportion of the absorbed sugar is oxidized and a smaller proportion is stored as glycogen than with normal rats; treatment of the hypophysectomized animals with anterior pituitary extract can restore their behaviour in this respect to normal. Normal rats treated with anterior pituitary extract and fed glucose oxidize less sugar and store more glycogen than do untreated animals (Russell, 1938).

In general it appears that the secretions of the anterior pituitary lobe depress carbohydrate oxidation in the muscles and promote glycogen storage both from exogenous carbohydrate and from endogenous protein.

Influence of Pituitary Extracts on the Islets of Langerhans of the Pancreas

In 1933 Anselmino, Herold, and Hoffmann claimed that the administration of an anterior pituitary extract to normal rats results in a few days in a substantial increase in the number and size of the islets of Langerhans of the pancreas. Although Richardson and Young (1937) were unable to confirm these results under the defined conditions, they were nevertheless able to show that in the rat the amount of islet tissue present may be doubled by suitable treatment with a crude anterior lobe extract. Such a crude extract is diabetogenic in the dog but almost completely ineffective as a diabetogenic agent in the rat. More recently Marks and Young (1939) have shown that the amount of insulin in the pancreas of the rat is greatly increased by the administration of such an extract. It seems possible that the rat is relatively insensitive to the diabetogenic action of a crude pituitary extract because of a rapid functional hypertrophy of the islet tissue.

The Pituitary Gland and Ketogenesis

Treatment of fat-fed rats with anterior pituitary extract results in a substantial increase in the excretion of ketone bodies (Burn and Ling, 1930). The administration of such ketogenic extracts is followed by a rapid accumulation of fat in the liver, apparently at the expense of the fat depots (Best and Campbell, 1938).

The ketonuria of the depancreatized dog is diminished by hypophysectomy, and it seems that the secretions of the anterior pituitary lobe stimulate those processes in the body which lead to an accumulation of ketone bodies in the blood. It is possible that depression of carbohydrate oxidation and of protein katabolism (Shipley and Long, 1938), or the stimulation of the metabolic rate (Collip, 1938), by increasing the rate of oxidation of fat, accounts for the ketogenesis which follows the injection of anterior pituitary extract.

The Anterior Pituitary Gland and Experimental Diabetes

The alleviation of experimental diabetes by hypophysectomy and the induction of a diabetic condition by treatment with anterior pituitary extract have already been mentioned. The diabetogenic action of anterior pituitary extracts cannot easily be demonstrated in all species of animals, and some, such as the rat, are apparently almost entirely resistant. This species variation may be due to differences in the amount and activity of the pancreatic islets in the different species. In the dog, which appears to be the most suitable animal for the demonstration of the diabetogenic activity of anterior pituitary extracts, the response to the *daily* administration of a small dose of extract can be divided in three phases: (1) A latent phase of three to five days, during which glycosuria or ketonuria is not observed and the blood-sugar level is little affected. During this period, however, the animal develops a relative resistance to the hypoglycaemic action of injected insulin. (2) The phase of temporary diabetes, lasting for three to seven days, during which glycosuria, ketonuria, and polyuria appear, rise to maximum values, and then decline and disappear, despite the continued daily injection of the same amount of extract. The animal remains relatively insensitive to the hypoglycaemic action of insulin during this phase, and the liver glycogen level may be somewhat raised. (3) The refractory phase, which may last for a long period, perhaps indefinitely; during this phase glycosuria and ketonuria are absent, but for some time the animal remains relatively insensitive to the action of administered insulin. The fasting liver glycogen level may be high. The development of the refractory phase may be circumvented by increasing every few days the amount of extract injected daily. In this way, after a period of treatment lasting one and a half to four weeks, the period of temporary diabetes may be succeeded by that of permanent diabetes, which persists indefinitely after cessation of treatment with pituitary extract (Young, 1937). Dogs in which a permanent condition of diabetes has thus been induced by treatment with pituitary extract for a short period are not obviously insensitive to the hypoglycaemic action of insulin, although it is possible that they require more insulin for the regulation of glycosuria than do depancreatized dogs.

The histological appearance of the endocrine glands of dogs thus made permanently diabetic is not obviously abnormal, with the exception of that of the islets of Langerhans of the pancreas (Richardson and Young, 1938). The observed changes in the islets vary from depletion of the cytoplasmic granules of the beta cells to complete replacement of islet tissue by hyaline material.

The metabolism of these pituitary-diabetic animals differs from that of depancreatized dogs in some respects, most strikingly in that the pituitary animals are able to survive for long periods without insulin therapy, despite the fact that they apparently require more insulin for the control of glycosuria than do depancreatized dogs, which, under similar conditions, may quickly die when insulin treatment is stopped.

Mechanism of Control of Carbohydrate Metabolism by the Anterior Pituitary Gland

As we have seen, treatment with anterior pituitary extract can diminish carbohydrate oxidation in the muscles and promote sugar formation from protein in the liver. Both these processes could contribute to the production of a diabetic state. There is evidence to show that in the muscles the action of insulin in promoting the formation of glycogen and the oxidation of sugar may be diminished under the influence of anterior pituitary extract (Marks, 1936; Himsworth and Scott, 1938); because insulin hypoglycaemia may be completely abolished in pituitary-treated animals, it may be inferred that the action of insulin on the liver is also inhibited by treatment with anterior pituitary extract. All these processes would assist in the production of a diabetic condition.

The diabetogenic action of anterior pituitary extracts is lacking in the absence of the liver (Houssay) and is depressed in cases of adrenocortical insufficiency (Long). There is no evidence to show that other endocrine glands are as intimately concerned in the control of carbohydrate metabolism by the anterior pituitary gland as is the adrenal cortex; the adrenal medulla is probably of no great importance in this connexion. Ranson and others have brought forward evidence which suggests that the hypothalamus is intimately involved in the control of carbohydrate metabolism exerted by the anterior pituitary lobe.

It is not yet clear how many different anterior pituitary substances are concerned in this control of carbohydrate metabolism. It is certain that the glycotrophic substance is not itself diabetogenic, but it is possible that the diabetogenic factor consists of a complex containing the glycotrophic substance, together with one or more other active principles. It is conceivable that the glycotrophic and glycostatic substances are identical, but it appears improbable that either is identical with the substance stimulating liver glycogen formation, the action of which is mediated by the adrenal cortex.

An interesting possibility is the identity of the growth hormone with the diabetogenic substance. The evidence at present available is compatible with such an idea, if it be assumed that integrity of pancreatic function is essential for the nitrogen retention required for a period of pituitary-stimulated growth. If the pancreas is unable to sustain the demand thus imposed a diabetic condition might develop, which, however, would be only temporary if the pancreatic islets were later able to hypertrophy. Such a theory would account for the observed development of refractoriness to the diabetogenic action of small doses of anterior pituitary extract (vide supra).

Possible Clinical Significance of Recent Experimental Investigations

In many instances the blood of diabetic patients of the "insulin-resistant" type possesses glycotrophic activity—that is to say, a rabbit treated with the plasma or serum of such a patient develops insensitivity to the subsequent administration of insulin. Such patients may exhibit obvious signs of pituitary hyperactivity, although this may not always be so (de Wesselow and Griffiths, 1936). There is no reason to doubt that a limited number of diabetic patients exhibit an insulin-resistant diabetic condition which is of anterior pituitary origin; the majority of diabetic patients do not obviously fall into this class, however. Nevertheless, if the results of the investigations on the experimental induction of a permanently diabetic condition by a short treatment with anterior pituitary extract are of significance to human diabetes, then it is possible that a short period of spontaneous pituitary hyperactivity in a human being might result in such lesions to the islets of Langerhans as to produce a permanent state of diabetes, although no other persistent sign of pituitary hyperactivity might be found. In such

a case the diabetes need not be of an "insulin-resistant" type, and would appear to result primarily from the islet lesions. Nevertheless it is possible that such islet lesions might themselves be secondary to a short period of anterior pituitary hyperactivity.

Summary

Evidence is given of the significance of the anterior portion of the pituitary gland in the control of carbohydrate metabolism in general, and, in particular, in the regulation of insulin sensitivity.

Many of the effects on carbohydrate metabolism of hypophysectomy and of the administration of anterior pituitary extracts are intimately related. They are here discussed under separate headings.

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The Ministry of Health has issued Part I of the Costing Returns for the year ending March 31, 1938, relating to all the principal institutions (other than infectious diseases hospitals) for the treatment of persons in need of medical or surgical care and attention which are administered or utilized by local authorities in England and Wales. These institutions include Poor Law hospitals, general hospitals administered by local authorities, sanatoria and other residential institutions for the treatment of tuberculosis, and maternity homes and hospitals. The object of this publication is to assist local authorities in the economical administration of the institutions under their control by enabling them to make comparisons between the average costs of their own institutions and of the comparable ones belonging to other authorities. The returns may be obtained from the Stationery Office, price 9d.

OCULAR REACTION TO FOREIGN PROTEIN

AN ACCOUNT OF A SLIGHTLY UNUSUAL CASE

BY

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Ocular manifestations of allergy are not very common, or possibly it may be that many such manifestations are not at the time actually recognized as such. This is not remarkable when one considers that the number of proteins which can give rise to allergic symptoms is so great that it is often difficult, or even impossible, to find the particular one responsible in a given case, especially if the patient's contact with it is spasmodic and there is nothing definite in the chronological history. The majority of the allergic conditions which come within the purview of the ophthalmic surgeon are external affections of the eyes—urticaria of the lids, shared with the rest of the skin of the body, the acute conjunctivitis of hay fever, and the conjunctivitis occurring in those sensitive to orris root, etc. The cornea does not appear to be readily affected, although parenchymatous or interstitial keratitis is regarded by many as an allergic phenomenon. So far as I know, it is not generally thought that the deeper structures of the eye ever become seriously involved in ordinary allergic upsets, but they can become affected by acquiring unusual sensitivity towards lens protein and uveal pigment, etc. In the usual cases, therefore, of iritis, iridocyclitis, and so on which one sees in the consulting-room or out-patient department, hypersensitivity to foreign proteins does not readily spring to mind as a possible cause. In most cases one searches for the evasive "septic focus"—unsuccessfully often enough—and then treatment is limited to general principles, often with disappointing results. It is in view of this that I think the following case may perhaps be of some interest.

Case Record

In April, 1937, a young woman attended at the eye out-patient department at the Llandudno Hospital. She complained that the left eye had become slightly inflamed fourteen days previously and a few days later the right eye had followed suit. Vision had become slightly misty. On examination I found that there were some keratitic precipitates (k.p.) on the back of each cornea. The vitreous was hazy and vision was reduced to 6/12 with the right eye and 6/6 partly with the left eye. A diagnosis of double cyclitis was made, and she was placed on atropine and syr. ferri iod. The Wassermann reaction proved negative. She attended for two or three weeks, the only change being a slight increase in the "k.p." On May 7 she was admitted to hospital for investigation. This proved negative except for a very slight reaction to a tuberculin test. With hospital treatment, however, she improved slightly. About the middle of June she relapsed badly—large "mutton-fat k.p." were beginning to form and at the same time there was vascularization of some areas in the deeper layers of the corneae. At this time, hoping that a fresh point of view might be of value, I had her investigated at one of the larger eye hospitals. This investigation again revealed a slight reaction to tuberculin, and a course of injections was suggested and given. There was no improvement in her condition, which continued to be bad until October, 1938.

On October 14 she was, with some very faint hope, put on to prontosil album—four tablets (2 grammes) daily—with the usual warning as to diet. On November 4 she came to the

out-patient department with both eyes open, the congestion practically cleared, and with only little evidence of active cyclitis. She informed me that this remarkable change in her eyes had started about ten to fourteen days previously. I saw her again on the 18th, and by this time one might say that, but for the evidences of past inflammation, the eyes were practically normal externally and the vitreous haze seemed to be clearing well.

Although fully aware of the many curative triumphs of prontosil, I was, in spite of the rather dramatic change, completely puzzled to account for its effect here. It appeared to me that if prontosil had dealt so effectually with whatever septic focus was at the root of the trouble, surely this focus would have been made evident by ordinary clinical signs and symptoms and would have been discovered during the course of the investigations which she had undergone. I cross-examined her about her general condition, and it appeared that she felt much better and thought this was because she had stopped eating eggs. This seemed significant, and I asked her if she had noticed whether anything else to do with fowl had affected her. She said that she liked chicken, but that it disagreed with her. She slept on a feather bed, and her sister volunteered the information that she always complained that she never felt rested on it and would prefer a hair mattress. This, of course, may have been merely a question of physical comfort. It was decided to stop prontosil and all other treatment, and she was advised to continue on an egg-free and chicken-free diet and to change her mattress.

She came to see me again on December 16, and I was extremely disappointed to notice that she seemed to have had a relapse. The photophobia, congestion, and lacrimation were all present again. I asked her when this had occurred, and she gave me this rather remarkable account. It appeared that her eyes were perfectly well until December 13. On that day she was breaking eggs to help to make a Christmas cake. Some of the egg-white got on to the back of her hand. She rubbed it off, but a few minutes later the skin of her hand began to itch and about an hour later the photophobia, lacrimation, and mistiness of vision had returned. These continued severely for about twenty-four hours, but gradually improved, and she said, when I saw her, that she was much better than she had been. All the symptoms cleared up in two or three days, and she continued perfectly well until January 3, 1939, when her sister rubbed a little egg-white on her hand again. She did this at 3 p.m., and by 7 p.m. all the old symptoms had returned. They cleared again by the 6th.

She was readmitted to hospital and her sensitivity to egg-white was verified again. A little egg-white about the size of a sixpence was rubbed into her left arm. The skin became reddened and irritable, the conjunctiva became injected within an hour, and in two hours she could not open her eyes owing to intense photophobia and lacrimation. A course of desensitization was begun before she left hospital, and she is still on it. After each injection she has had an "eye reaction," but these are becoming less severe, and it is possible that she may eventually be completely desensitized to egg protein, etc. Between injections the eyes are perfectly clean and quiet, there is a faint vitreous haze, and the only really obvious traces of her past trouble are the corneal nebulae which followed the vascularization when the cyclitis was at its height. Her vision is now quite good. Actually she has escaped lightly, when one considers that her acute symptoms lasted from April, 1937, to October, 1938—a period of eighteen months.

Since I last saw the patient I have attended another young woman who had a mild iritis in one eye which resisted treatment for many weeks. All investigations proved negative. The eye could be kept fairly quiet on atropine, but flared up acutely when this was stopped. In reply to my question she told me that she was extremely fond of eggs, and I suggested that she should stop them, which she did, with practically the immediate cessation of the iritis, which has not recurred since.

This second case might be purely coincidental, and I just mention it as a matter of interest. There does not, however, appear to be much doubt in the former case that the egg, chicken, etc., proteins were either the actual cause of her iridocyclitis or that the eyes became sensitized to them during an attack of iridocyclitis and the acute symptoms had been kept up by the consumption of eggs and chicken—which had been rather high in an attempt to "feed her up well."

Whatever may be the true solution in this case, since cyclitis of unknown origin is so often resistant to treatment and so frequently means a gloomy prognosis, I feel that the account of the peculiar circumstances may be of some value as a possible clue to the cause of other cases of uveal inflammation for which no obvious reason can be discovered.

Clinical Memoranda

Suspected Case of Vitamin B_1 Deficiency

The suspected case of vitamin B_1 deficiency recorded below may be compared with one of pink disease which recently came under my care. In the latter the patient, a male child aged 17 months, showed the same objection to being handled, and the pink or, rather, red colour had a similar distribution to the areas of congestion in the present case. The patient with pink disease was also brought to me by the parent on account of "failure to pass water." Improvement was satisfactory under sedative treatment directed at controlling the attacks of peripheral irritation associated with the condition, but for some ten weeks the patient passed water only twice and sometimes only once a day, there being obviously great discomfort each time. Unfortunately I did not try vitamin B therapy.

CASE RECORD

At 9 o'clock one evening I received a call to a female child 5 months old.

History.—On arrival the mother told me that the child had been perfectly well until the evening of the previous day, when she had not taken her 10 p.m. feed. Afterwards she spent a quiet night, but appeared listless in the morning and did not take her feed. During the day she lay very still, seemed to resent being touched or picked up, and the mother noticed that the breathing gradually became more rapid. The child refused all her feeds, but took orange juice and boiled water greedily. She passed two rather loose motions. The child had not been breast-fed owing to inability on the part of the mother. She had been reared on dilutions of a well-known brand of unsweetened condensed milk, with added brown sugar and halibut-liver oil, 2 minims twice daily. A teaspoonful of orange juice had been given in 2 oz. of water twice a day.

Examination.—The child resented being handled. She appeared well nourished but very dehydrated. The extremities of all four limbs were very cold and much congested, the congestion extending from just below the elbow to the finger-tips and from the junction of the lower and middle thirds of the tibia to the tips of the toes. The respiration rate was 48, with good air entry all over both lungs. Temperature 97.6° F.; pulse rate 160. Nothing abnormal was found in the nervous system. I was puzzled to account for the syndrome, advised the mother to keep the child warm and give it only boiled water, and said that I would see it again the following morning. At 10 a.m. the next day the report was that the child had been quiet all night except for the rapid breathing. She had passed neither urine nor faeces, and had taken only very little of the boiled

water. On examination the child was more dehydrated; the purple congestion of the extremities was more marked; while the other signs were the same except for the development of crepitations over the bases and hilar areas of both lungs, and a thick yellow discharge from both eyes.

Vitamin B deficiency seemed the only possible cause, so ampoules of betaxan were ordered. At 2 p.m. I gave 800 units intramuscularly. When I returned at 8.30 p.m. the mother greeted me at the door with "Baby is much better, and has been so since 4 o'clock, when she took 8 oz. of boiled water." She had passed water and her bowels had opened. The congestion of the extremities was less, particularly in the arms. The respiration rate had dropped to 36, and the heart rate to 140; dehydration was still pronounced. I repeated the injection that night and the following morning; by the evening of that day the child was normal. She is now being fed on cow's milk and marmite water.

COMMENT

First, there is a danger for infants of too low a vitamin B diet in certain cases, presumably when there is a poor foetal store. Secondly, the onset was acute, apparently due to the store suddenly becoming exhausted. Thirdly, there would appear to be need for information concerning the effect of condensing and drying processes on the vitamin B content of milk.

Bristol. T. RODBARD AUBREY.

Achalasia, with Pleural Effusion, simulating Mediastinal Growth

The following case seems worthy of record on account of its rarity.

CASE REPORT

A woman aged 51 was referred to me in October, 1938, because of the following combination of symptoms and signs: a tendency to sickness during meals, recent marked loss of weight, anaemia, a left-sided pleural effusion, with temperature up to 101°. The history was as follows: "For some time" she had complained of a tendency to "sickness" during meals. This proved on inquiry to be a difficulty in swallowing properly, so much so that she had to go out several times during a meal to bring up food. Exactly how long this had been going on it was extremely difficult to elicit, but there was no doubt that the symptom had been really troublesome for only a few months. Since August she had lost 2 st. in weight. In September a curious rash appeared on the arms and legs, papular and vesicular in character. Later in this month she experienced pain in the left side of her chest.

October 3.—There were signs of fluid at the left base. The tongue was furred. Blood count: red cells, 3,900,000 per c.mm.; haemoglobin, 58 per cent.; white cells, 7,600 per c.mm. The sedimentation rate was normal. The temperature was normal at this time, but soon rose to between 100° and 101°, at which height it persisted for some weeks.

October 9.—The chest was explored and a clear straw-coloured fluid was obtained, which was sterile and contained 75 per cent. lymphocytes and 25 per cent. polymorphs. A skiagram of the chest showed what appeared to be a large mediastinal mass, as well as the shadow of fluid on the left side. A barium bolus was given and this appeared to outline an oesophagus of normal calibre, an appearance which later investigation showed to be illusory.

October 20.—The patient was admitted to hospital for further investigation. The difficulty in swallowing, the pleural effusion, the loss of weight, and the anaemia all pointed to a diagnosis, which in fact had been suggested, of a mediastinal growth with invasion of the pleura. Another skiagram was taken, and the mediastinal shadow, alhough very wide, was not convincingly the shadow of a tumour, although it is possible that sarcoma, lymphadenoma, or leukaemia might present a somewhat similar picture.

October 21.—The pleural effusion was replaced by air, 15 oz. of yellow slightly turbid fluid being aspirated from the left pleural cavity. Microscopical examination of the fluid showed this time a predominance of polymorphonuclear cells, a considerable number of endothelial cells, and some lymphocytes. No tubercle bacilli: cultures sterile. Laryngoscopy revealed nothing abnormal. Blood count: red cells, 4,300,000 per c.mm.; haemoglobin, 50 per cent.; colour index, 0.6; white cells, 12,000 per c.mm.—polymorphs, 73 per cent.; lymphocytes, 19 per cent.; eosinophils, 1 per cent.; mononuclears, 7 per cent. No abnormal red cells.

October 25.—The temperature ranged between 100° and 101°. The leucocyte count was rising, being 14,000 per c.mm. on October 27. There was no occult blood in the stools.

November 2.—Blood count: red cells, 4,000,000 per c.mm. (mean diameter 6 μ, some variability in size and shape); haemoglobin, 52 per cent.; colour index, 0.65; white cells, 12,000 per c.mm. About this time the rash on the arms and legs was more pronounced. It was like erythema nodosum, though the nodules were smaller.

It was then decided to make a completely fresh radiological examination of the chest. A careful barium swallow examination was obviously a thing of the first importance because of the dysphagia. After much persuasion and encouragement the patient managed to swallow a fair amount of barium, and a greatly dilated oesophagus, with a long delay at the cardiac end, was demonstrated. The mediastinal mass was now explained: the supposed tumour was, in fact, a mass of food in a dilated oesophagus. This is worthy of note, because Hurst has reported a case where a long course of deep *x*-ray therapy had been given for such a condition. The question now arose, Was the diagnosis a carcinoma of the lower end of the oesophagus or an achalasia? If achalasia, why the pleural effusion? Had she had an inhalation low-grade bronchopneumonia with effusion? Could it be due to an oesophagitis? Or was it a tuberculous effusion arising in a woman debilitated by malnutrition? And was the anaemia nutritional or toxic?

November 8.—Under avertin anaesthesia an oesophagoscope was passed by Mr. Suggit. Masses of foodstuff had to be removed by the sucker before the instrument could be passed down. The cardiac sphincter was found to be in a state of extreme spasm. A nodular appearance was seen at the lower end of the oesophagus, and a piece of this was taken for section. Dr. Gloyne reported that the evidence, on the whole, was against malignancy. After the oesophagoscopy a bronchoscope was passed in order to see if there was any abnormality in the bronchial tree and that no foodstuff had been aspirated. Apart from bulging of the posterior wall of the trachea no abnormality was seen. Atropine and a liquid diet were given, the rash improved, and the pleural effusion entirely disappeared.

Shortly after, Sir Arthur Hurst kindly saw the patient with me. He agreed with a diagnosis of achalasia and that the pleural effusion might be secondary to the oesophagitis, though, so far as he knew, this complication had not been recorded. He advised dilatation treatment by bougie—three times a day for the first week, once a day the second week, and then gradually increasing the interval between the treatments—water to be taken after each treatment and a liquid diet for three weeks, followed by a gradual return to a normal diet. This was carried out: the patient steadily improved, she gained over a stone in weight, lost her anaemia, and in January began to eat all ordinary food. The temperature became normal on December 22.

In April, 1939, the clinical condition was reported as excellent and the blood picture was almost normal.

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Reviews

PROBLEMS OF AGEING

Problems of Ageing. Biological and Medical Aspects. Edited by E. V. Cowdry. (Pp. 758; 121 figures. 45s.) London: Baillière, Tindall and Cox. 1939.

This authoritative publication of the Josiah Macy, jun., Foundation is a timely and logical sequel to the survey of the problem of arteriosclerosis brought out in 1933 and also edited by the professor of cytology in Washington University, St. Louis, who performed a similar service for the successful *Special Cytology* (1928) by thirty-five contributors. This present symposium is fortified by a foreword from Mr. Lawrence K. Frank of the Foundation, which in 1937 sponsored a conference on ageing at Woods Hole, attended by fifteen out of the twenty-six contributors. The wide scope of the contents—psychological, sociological, economic, as well as physical and biological—is illustrated in the masterly introduction by Dr. John Dewey, emeritus professor of philosophy, Columbia University, New York.

The first four chapters deal with ageing in plants, protozoa, and invertebrates, insects, and vertebrates, and then, under the title "Human Cultural Levels," Dr. Clark Wissler, professor of anthropology at Yale, shows how far anthropometry has elucidated the problems of old age, and how much remains to be settled—for example, whether the bodies of all peoples and under all environments age in the same way and at the same time. Dr. Louis I. Dublin, statistician to the Metropolitan Life Insurance Company, New York, writes on longevity in retrospect and prospect, and supplies much statistical matter from which may be quoted the remarkable rise in the mean expectation of life at birth in the United States from 35.5 years in 1789 to a little more than sixty years in 1930. He concludes that by some inexorable law still to be discovered and clarified Nature has allotted to man a life span of about a hundred years, but few there be that complete this span.

The remaining nineteen chapters, and five-sixths of the volume, are devoted to the more purely medical aspects of old age and admirably summarize the detailed knowledge now available, much of which is due to researches carried out by the individual authors. Professor W. B. Cannon of Harvard describes ageing of the homoeostatic mechanisms—the condition of relative constancy in the internal environment of the living parts—which become progressively limited in their efficiency. Dr. A. E. Cohn of the Rockefeller Institute writes with wide experience, flavoured with wise philosophy, on ageing of the cardiovascular system and the blood. Professor E. B. Krumbhaar takes charge of the lymphatic tissues, the editor looks after the tissue fluids, and Dr. Macdonald Critchley, the only contributor from this side of the Atlantic, deals with the nervous system in old age. The psychological aspects in general are considered by Professor W. R. Miles, and in reference to sex by Dr. G. Hamilton. Professor Lewellys Barker reviews ageing from the point of view of the clinician with a plea for greater attention from his colleagues. This is a storehouse of knowledge and must long be a source of reference.

HUMPHRY ROLLESTON.

HISTOLOGY OF INTRACRANIAL TUMOURS

Histological Technique for Intracranial Tumours. By Dorothy S. Russell, M.D. (Pp. 71; 6 plates. 7s. 6d. net.) London: Oxford University Press. 1939.

Two requirements seem necessary to justify the production of yet another medical textbook: first, special experience of the author in a particular field of work; and, secondly, the existence of a real need among a section of the profession for help in such a field. Dr. Russell's *Histological Technique for Intracranial Tumours* fulfils these two requirements. A pathological report based on the modern classification of cerebral tumours is now expected from any general laboratory. The special staining methods necessary are not widely known, and the general worker has often great difficulty in selecting methods from the larger handbooks. It is therefore valuable that Dr. Russell has made available from her own experience a list of the methods necessary for a specific problem—namely, the diagnosis of cerebral tumours.

The general plan of the book is excellent. Important details which might be considered elementary are emphasized, beginning with the handling of the specimens. The staining methods are clearly set forth, and the methods necessary for different types of tumour are grouped together in the final chapter. Methods for the rapid diagnosis of biopsy material are rightly included, as neurosurgeons are tending more and more to force such a study on their colleagues in the laboratory. The aim of the book has been adequately achieved, though perhaps more details about the applicability of the methods to celloidin material would have tended to make the work more complete. The book will, however, be found invaluable to the general histologist confronted with the problem of the diagnosis of cerebral tumours, and the specialist in this field will also on occasion find it useful for reference.

ESSENTIALS OF RADIOGRAPHY

Positioning in Radiography. By K. C. Clark. (Pp. 482; 1,190 figures. 63s.) London: W. Heinemann. 1939.

The book by Miss K. C. Clark is large and expensive, but it is well worth the money. The 1,190 illustrations, including photographs of subjects in position for radiography, the resulting radiographs, and numerous line drawings, form the foundation of this volume, and are accompanied by commendably concise descriptions of radiographic techniques. Both photographs and radiographs are magnificently reproduced and are technically of the highest quality.

The first hundred pages deal with the bones of the extremities and describe the positions used in everyday radiography, as well as certain positions which are of value for patients so severely injured that standard views are difficult to obtain. In this respect the humerus, shoulder-joint, and scapula are particularly well described. Next come the spine, pelvis, and thoracic cage. A further one hundred or more pages are devoted to the skull, and here the sections on the radiography of the sinuses, of the temporal bones, and of the ventricular system are especially valuable. The heart and aorta are adequately dealt with, and a short account of kymography follows. The chapter on the respiratory system is good, but the brief note on the principles underlying tomography might well be clarified a little. The technique of the barium meal and the barium enema lies within the province of the radiologist rather than of the radiographer, for whom this book is primarily intended, so the somewhat sketchy nature of the section on the alimentary tract may perhaps be excused. The technique indicated for the administra-

tion of the barium enema indicates a certain lack of familiarity with the practical details of this type of work. The chapters on the gall-bladder and on the urinary tract are well written and fully illustrated, and the various positions used in obstetric radiography are indicated. In the localization of foreign bodies in the lung the danger of employing only the postero-anterior view is wisely stressed. But in connexion with foreign bodies in the orbit and eye Sweet's localizer is not mentioned, although this is the most usual method in this country. Considerable attention is paid, however, to methods based on the movement of the shadow of the foreign body when the eye is moved, in spite of the fact that this is now recognized to be an inferior method of localization for foreign bodies within the eyeball. Dental radiography is admirably described and illustrated, and the book ends with short sections on the soft tissues, myelography, stereography, and cineradiography. The index is complete and well arranged.

This is a book that should be in every *x*-ray department. It is one which has long been wanted, both by radiographers and by radiologists. The author, the publishers, and Ilford Limited are to be congratulated on a very fine piece of work.

THERAPEUTIC PROGRESS IN 1938

L'Année Thérapeutique. Médications et Procédés Nouveaux. By A. Ravina. Thirteenth year, 1938. (Pp. 188. 25 fr.) Paris: Masson et Cie. 1939.

It is an interesting part of any matter to read how it strikes a contemporary. For many years Professor Ravina has published a series of reviews of therapeutic advances under the title *L'Année Thérapeutique*. The thirteenth number, that for 1938, is arranged on similar lines to the preceding volumes: first, extracts from medical journals, French, German, and English, dealing with the treatment of some diseases and symptoms; then some old and new methods of treatment; and, finally, a section on new medicines. Readers will find the reports, culled from many sources, accurate and likely to be helpful. The index is well prepared and full.

It is rather as a review of therapeutic progress seen through the eyes of a critical observer, giving an idea of the trend of present-day medicine, that the book has a broader appeal. To the logical French mind, injection (*piqûre*) has always been the method of choice for administering drugs, and this both for local and general effect. Vaccines have only a limited application and are rarely recommended. The modern intravenous anaesthetics are much used, and, keeping in mind some gross contraindications, may be used with comparative safety. Local injections are much advocated—novocain, and a less toxic product, percaine, for pain in many situations; in some rheumatic conditions local injections of the patient's own blood withdrawn from a vein (autohaemotherapy) are shown to be valuable. Cocainization of the phrenic nerve in intractable hiccup, pilocarpine for Ménière's disease, and the use of acetylcholine and histamine injected round the affected joints in chronic rheumatism or brought to the periarticular tissues by ionization are other methods which have proved successful. Drugs of the sulphonamide group are now on the crest of the wave, and their use in many infections, especially coccal infections, is established. Their value appears to lie in the concentration in the blood of the anti-bacterial substance; this is rapidly excreted, but may have harmful effects on parenchymatous organs, and there are risks in their use. Provided the urinary excretion is good and there is no fall in the red blood corpuscles, however, the drug should be pushed to adequate dosage in spite of some cyanosis; insufficient doses are almost useless. The hormones are finding wider application; insulin not only for diabetes but also combined with sugar for hepatic disease and alcoholism; heparin in post-operative thrombosis and blood transfusion; and the male and female hormones of pituitary and gonads, which have been differentiated and classified, not only in the disorders of menstruation and pregnancy but also in cases of asthenia, enlarged prostate, enuresis. Valuable reports are added on the use of the various vitamins. Many good results in the treatment of neuralgias and peripheral pains are attributed to the vitamin B_1; vitamin C is reported to assist histidine in the treatment of peptic ulcer; and an oily preparation of vitamins A and D has helped in clearing purulent rhinitis.

SURGICAL ANATOMY

Surgical Anatomy. By C. Latimer Callander, A.B., M.D., F.A.C.S. With a Foreword by Dean Lewis, M.D., Sc.D., LL.D., F.A.C.S. Second edition. (Pp. 858; 819 figures. 45s. net.) London: W. B. Saunders. 1939.

The second edition of Callander's *Surgical Anatomy* has been revised and reset; moreover, much new matter and many new illustrations have been added. The enormous amount of work which this rearrangement has entailed can only have been accomplished with the co-operation and assistance of many workers, among whom the artists, Mr. Sweet and Miss Gelken, are to be congratulated on the skilful manner in which some of the new "multi-figured drawings" have been executed. Notwithstanding the inclusion of recent work on, for example, ganglionectomy of the lumbar sympathetic system, resection of the sacral plexus, and the surgical treatment of conditions affecting the posterior mediastinum, the lungs, heart, and pericardium, the revision has not been accompanied by any increase in the size of the volume, since much which has now become obsolete has been omitted. The author has not erred in the direction of describing operations which are only seldom performed, and then only by a limited number of specialists, but has apparently endeavoured to keep within the bounds of the everyday work of a general surgeon, or of ophthalmic, ear, nose, and throat, or gynaecological practitioners. Among much which is worthy of note one may specially mention the section on intestinal anastomoses. There are, too, admirable reviews of the surgical anatomy of the vertebral column and spinal cord and of the principal operations on the limbs, among which the author's "tendo-plastic amputation through the femur at the knee" may be cited as an example of how much detailed information may be clearly conveyed by a brief description in the text when this is combined with the "multifigured" type of illustration. The book will be particularly valuable to students and medical practitioners who wish to acquire a general knowledge of surgical procedures without making a complete study of those full technical details which are only to be found in monographs on the operative surgery of special regions.

DISORDERS OF MENSTRUATION

Menstrual Disorders: Pathology, Diagnosis and Treatment. By C. Frederic Fluhmann, B.A., M.D., C.M. (Pp. 329; 119 figures; 12 tables. 22s. 6d. net.) London: W. B. Saunders. 1939.

This book gives an orderly presentation of modern knowledge of human ovarian function. Professor Fluhmann has the gift of simple classification and clear statement, and there is no mistiness about his outlook on the still unfinished edges of the picture. His chapter on the sex

hormones, for instance, though particularly well built up, closes with the reflection that the investigation now beginning of the relation between male and female sex hormones may eventually modify all our beliefs.

The book begins with an entertaining chapter on historical concepts of menstruation. The second chapter is headed by the useful word "menarche" (*μήναρχή*), and deals fully with both the normal and the abnormal. The morphology and comparative physiology of the menstrual cycle are next dealt with, and then come four chapters on the sex hormones, their interrelation and control. Hormone therapy by mouth is judicially found wanting. The disorders and abnormalities of menstruation are discussed as to causes, incidence, and practical treatment. The closing chapter is a sane one on the menopause. The index and illustrations are good, and throughout the book the information given is full and accurate. Almost the only statement which is not actually backed by a reference to authority is that on the ultimate effect of irradiation of the gonads. Though apparently normal pregnancies have followed recovery from irradiation of the ovaries, the possibility of injury to the germ plasm still exists, the author points out. The American Medical Association's classification of ovarian hormones into (1) oestrogenic principles and (2) progestin is used by the author, and certainly adds to his clarity.

Professor Fluhmann suggests that irregularities of ovarian function may be accounted for by the interesting possibility that new ova are developed during adult life from potential cells in the cortex. He makes no reference to Dr. Samuels's hypothesis that ovulation normally occurs bi-monthly.

Notes on Books

The small handbook entitled *Post-mortem Appearances*, by Dr. JOAN M. ROSS, has been found exceedingly useful, chiefly by two classes of person—the practitioner who has to do an occasional post-mortem, and the student who wants to know what to look for in the hospital post-mortem room. The fourth edition, which is now published (Oxford University Press, 7s. 6d.), is longer by thirty-two pages, though unaltered in price; the chief additions are a chapter on stillbirths and neonatal deaths, and a description of the effects of poisonous gases.

The nine articles in *Actualités Médico-Chirurgicales* (Paris, Masson et Cie, 30 fr.), contributed by active teachers, are devoted to medical and surgical problems in the proportion of six to three, and those from the physicians have a rather neurological flavour. Thus there are accounts of the following subjects: psychical disorders in acute encephalitis in children, paralysis in cardiac patients, nervous accidents in bradycardia, and vascular spasm of the cerebral vessels. The surgical articles deal with intestinal perforation in typhoid fever, abscess of the lung, and congenital dislocation of the hip. There is an interesting discussion on the modifying influence of insulin on pulmonary tuberculosis in the course of diabetes mellitus, and the syndromes of insufficiency of the bone marrow are classified in an attractive manner.

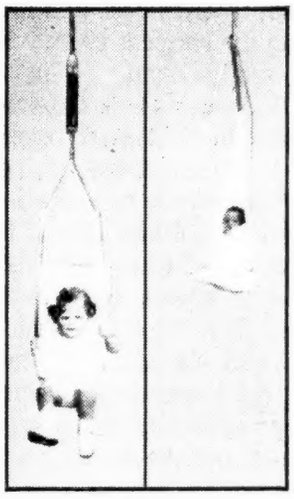
Le Sérum Normal: Propriétés Physiologiques, by DENIS BROCQ-ROUSSEU and GASTON ROUSSEL, is published at 140 francs by Masson of Paris. This second volume on the physiological properties of normal serum is an uncritical collection of quotations from various authors. Although reference is made to 3,925 papers and books, the result is very incomplete. Thus, although pages of contradictory observations on the passage of antibodies from mother to foetus are quoted, no reference is made to the relative importance of the placental and mammary routes in different animals. Observations on the proportion of cases in which maternal serum agglutinates the red blood corpuscles of the child are quoted, but the mode of inheritance of the blood groups is not mentioned. There is no index.

Preparations and Appliances

HAMMOCK FOR NURSING BABIES

Dr. JOHN J. MARNER (Liverpool) writes:

A method of treatment of infants in the upright position has been adopted in children's hospitals and institutions in Uruguay and on the Continent for some years. This method appears to be little known in England. The great danger to infants of being maintained in the recumbent position in their cots for prolonged periods has been recognized by many authorities. Children's institutions as a rule are inadequately staffed to provide the amount of handling and nursing necessary for young babies, and the use of an appliance in which the child can be maintained in the upright position at intervals is a way of trying to overcome this difficulty. In 1930 a suspension apparatus was adopted by Dr. J. Obes Polleri in Montevideo; in this the babies can be maintained seated in the upright position for desired periods, and it is believed that this mode of treatment prevents the development of pulmonary affections and is beneficial in their treatment. It is an attempt to provide for the baby the position provided by the mother when nursing. Advantages of the method are as follows: (1) It aids respiration and prevents hypostatic congestion of the lungs. (2) It prevents middle-ear disease, which is more liable to occur in the recumbent position, being favoured by a Eustachian tube which is large and short. (3) It helps digestion, the stomach emptying itself more quickly in the vertical position. (4) The psychic effect of more mental stimulation is beneficial to nutrition.



The suspension apparatus shown in the illustration has been in use in a babies home at Liverpool, and I have been able to form a favourable view of its usefulness. It serves the purpose of a hammock and a "corset"; it can be adapted to babies of different sizes, the model with legs extruded being used for older children. The infants can be fed and sleep comfortably in the suspension apparatus, and it can be attached to a tree for sun and air treatment. The system is adopted in Montevideo in the treatment of bronchopneumonia in feeble infants, and in the congenitally feeble from as early as ten days old.

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ORGANIZATION OF FRACTURE SERVICES

The war was responsible for great developments in the treatment of fractures, and more particularly in the organization of such treatment. The segregation of cases facilitated team-work and also allowed the completion of treatment to the point of restoration of full function in a single institution and under the supervision of one surgeon. It is to be feared, however, that the lessons which should have been learned were to a large extent ignored. With few exceptions hospitals continued to work on the old pre-war lines. Fracture cases were treated as ordinary surgical emergencies, and if admitted were scattered among the surgical units. Not until 1935 was anything really done. The report of the British Medical Association's Committee on Fractures,[1] published in that year, demonstrated the urgent need for reorganization, and attracted the attention of the public as well as of the medical profession and hospital and public health authorities. Moreover, it led directly to the appointment of the Interdepartmental Committee, which has now issued its final report.[2] The recommendations in this report do not differ in any essential from those of the Association's committee. They adhere to the principles of the segregation of fractures into special services under the unified control of a specialist surgeon, and of continuity of treatment until full restoration of function is achieved. Indeed, in the evidence put before the committee there was only one dissentient voice upon these points. But although on these matters of principle the report is clear and firm, there is perhaps a little less certainty when matters of detail come under discussion. The question arises: How large should a fracture unit be in order that it may be economical and efficient? At the present time hospitals are tending towards a unit of thirty to fifty beds for fractures alone, or a unit of fifty to sixty beds for fractures and orthopaedic cases. Units of such dimensions are large enough to occupy a surgeon with a full surgical team. There is a tendency, however, to whittle the unit down to half this size or even less. Will this not mean that the surgeon will necessarily take up other work which will distract his attention from the cases of fracture? It is well known that the lure of operative surgery has been a considerable factor in doing this in the past, and if the fracture surgeon in a provincial town is also the leading operating surgeon, his fracture work almost inevitably suffers. It is further suggested that quite small units in country districts might be supervised by a consultant, visiting possibly from a distance, a method which has proved notoriously unsatisfactory. Some assurance is required that every fracture service will be a real one, adequately equipped and staffed, and that it will not exist in name only.

The establishment of first-class fracture services inevitably means that some surgeons and some hospitals must sacrifice this side of their work in order to allow of the necessary segregation. It is to be hoped that the co-operation of voluntary hospitals, of local authorities, and of the medical profession will facilitate decisions as to the placing of these services in suitable institutions. Something has been done to this end in the report of the Voluntary Hospitals Commission,[3] and it seems that the British Hospitals Association is engaged in mapping out the whole of England and Wales into a number of divisions, in each of which an advisory body will be formed able to take steps towards the proper organization of hospital services. The difficulties of capital expenditure and of increased maintenance costs have undoubtedly delayed the development of fracture services. The cost of upkeep may be met by the co-operation of the local authorities with voluntary hospitals and perhaps by block grants from the Exchequer. Such assistance might be beneficial in facilitating some sort of central supervision, just as at present *per capita* grants to orthopaedic hospitals connote inspection by the Ministry of Health and the Board of Education. But while making these proposals for meeting the additional cost of upkeep the committee is unable to suggest any method of meeting capital expenditure other than by appeal to the charitable public. The fact that the committee has not suggested an Exchequer grant for this purpose seems to be a clear indication that such a suggestion would be ill received, and if a local authority undertook the capital expenditure it is improbable that it would contribute to a voluntary hospital rather than build its own fracture unit. The payment of the staff of fracture units is accepted as a principle, and the maximum suggested is £500 a year. It is questionable whether this will eventually prove adequate. Indeed, such an honorarium presumes that there will be private or consultant practice forthcoming to supplement it.

[1] *British Medical Journal Supplement*, 1935, **1**, 53.
[2] *Final Report of the Interdepartmental Committee on the Rehabilitation of Persons Injured by Accidents*. 1939. H.M. Stationery Office.
[3] *British Medical Journal*, 1937, **1**, 984.

But even at present private practice in fracture work is not abundant or well paid, and it will tend to diminish further as the organization for the treatment of fractures in hospital improves and becomes widely known. There is little doubt that with a well-organized department and team fracture treatment in hospital is better than any that can be given at home, and we see no reason to deny to the middle classes, who are able to pay, the facilities that will be made available for the poor. It would seem, therefore, that arrangements for paying patients should be included in the organization of a fracture unit, and this may provide a solution for the problem of the rate of payments to be made to the surgical staff. However, provided that the principle of payment is accepted this matter may perhaps be trusted to right itself.

It is somewhat remarkable that only four out of the twelve London teaching hospitals have fully developed fracture services upon the lines approved by the committee.* In the others fractures are still admitted to the wards of the individual surgeon, there is no segregation of cases, and there is no continuity of treatment. Moreover, the number of cases of fracture admitted to the wards of one unit is in some cases quite inadequate to enable a student to gain experience of their treatment in the course of his period of attendance in the wards. The reasons usually given for retaining this old system are the difficulties in the organization of teaching. But these difficulties are evidently not insuperable: they have been overcome in such provincial schools as those of Manchester and Liverpool. Although the apprenticeship system, whereby a student is for the period of his medical or surgical teaching attached to one physician or surgeon, is of old standing in the London schools and of undoubted value, it does not follow that it will always serve as a complete system. Increasing specialism makes it essential that the expenditure of the student's time should be more elastic, in order to facilitate his attendance in special departments. The recognition of this may call for drastic alterations in the organization of teaching, but, if this is necessary, it must be done. If the hospitals with teaching schools retain their present methods of treating fractures, the time may come when the ambulance will pass their gates and the student will have to leave his Alma Mater to learn of the treatment of fractures at a better-organized institution.

* A report just issued by the Fractures Subcommittee of the Voluntary Hospitals Committee for London suggests that a considerably larger number of the London teaching hospitals possess, or will shortly possess, fracture services conforming to the principles laid down by the Interdepartmental Committee. No evidence of this is given, however, and the subcommittee points out that "the degree to which the services provided by these hospitals conform to the principles laid down varies."

FIGHTING TUBERCULOSIS IN INDIA

A wide anti-tuberculosis campaign throughout India was one of the features of 1938, and the results are reviewed in the eighth annual report of the King George Thanksgiving (Anti-tuberculosis) Fund of the Indian Red Cross Society. The main objective was to overcome the fatalism in India in respect of this disease, to make the people realize that all are liable to infection with tuberculosis but that the great majority escape. It was emphasized during the year that the best way of attracting public opinion is through the educated section of the community, and that short special courses of instruction are very useful for teachers, university students, the oversea divisions of the St. John Ambulance Brigade, and nurses. There has been a growing demand from educational magazines for permission to reprint the articles and pictures supplied by the Fund, and anti-tuberculosis films were circulated by the Red Cross Library on a large scale. A special tuberculosis number of the *Indian Medical Gazette*, devoted entirely to the preventive aspects of the subject, has been of great practical help to those concerned in organizing anti-tuberculosis measures in the Provinces and Native States. A tuberculosis dispensary was opened in Bangalore early last year, and researches were carried out on the value of calcium therapy; calcium lactate proved to be assimilable and effective. Gold therapy and artificial pneumothorax were also employed in suitable cases. The Fund's report gives details of the work being done in the various Provinces of India, from which it is obvious that a determined stand is now being made against the spread of the disease and the apathy of the people.

The work of training anti-tuberculosis workers has proceeded actively in such centres as the All-India Institute of Hygiene and Public Health, Calcutta, and the Mayo Hospital in Lahore; it is now proposed to undertake the training of women tuberculosis health visitors at Delhi, and to stress the value of such preventive measures as open-air schools. Great success attended an appeal by the Marchioness of Linlithgow for the King-Emperor's Anti-tuberculosis Fund. The Fund appointed two committees: a technical committee of medical practitioners with expert knowledge of tuberculosis problems in India; and a constitution-drafting committee to consider the policies and planning of the proposed all-India tuberculosis organization to be formed as a result of the appeal. The approved recommendations of the second committee include recognition of the tuberculosis dispensary as occupying a front place in the organization for combating the disease in any area and as

the centre for preventive work. In urban areas the dispensaries would have their own staffs, but in rural areas tuberculosis clinics should be opened in existing dispensaries on fixed days in the week, with emergency beds for temporary use by patients needing observation or minor surgical treatment. Domiciliary treatment would be required in the majority of cases, however, and for this reason more attention must be devoted to problems of housing and nutrition as well as to the supply of trained health visitors, paid at uniform rates in each provincial or State area. Care and after-care committees on a voluntary basis should be set up in connexion with tuberculosis dispensaries. Close co-operation is urged between tuberculosis workers and doctors in general practice as well as with public health officials. More attention should be paid to the special training of medical and lay workers. Removal of infectious patients from close contact with healthy relatives should be effected by the provision of more sanatoria and hospitals, while some areas are ripe for tuberculosis colonies adapted to Indian conditions. An inquiry led to the conclusion that tuberculosis is responsible for 6.8 to 8.1 per cent. of all deaths in India, and is the second most serious cause of mortality from an insurance point of view. The Fund's central information bureau has been increasingly active; maps have been issued showing the sites of tuberculosis institutions, which reveal how inadequate the accommodation still is.

The campaign took a large step forward on March 29 of this year when the inaugural general meeting of the Tuberculosis Association of India was held at the Viceroy's House, New Delhi, with Lady Linlithgow in the chair. Major-General E. W. C. Bradfield, chairman of the central committee, explained the constitution of the new body and the methods that can be employed to attain its objects. It succeeds the King George Thanksgiving Fund, and is thus heir to the valuable pioneer work of the older organization, whose funds, management, and secretarial staff it has taken over.

POST-PARTUM HAEMORRHAGE

Excessive haemorrhage during and immediately after the third stage of labour has been aptly termed "obstetric enemy number one," for, apart from the occasional tragedy of a sudden death, the chronic morbidity resulting from lesser degrees of loss of blood, though less dramatic, is of almost equal moment. The introduction by Chassar Moir[1] of ergometrine has been of great importance in this connexion, but until lately no adequate clinical assessment has been made of its immediate therapeutic value. This has now been done by A. M. Reich,[2] and the results of his extensive investigations are of much clinical interest. These involved a study of the factors influencing the loss of blood in over 2,000 consecutive obstetric cases, taken for comparison over two periods with different methods of treatment. Applying the standard definition of 500 c.cm. of blood or over, as constituting post-partum haemorrhage, the incidence in these cases was 10.5 per cent.—a figure corresponding to most of those recorded earlier. Predisposing factors were operative interference (particularly when associated with prolonged anaesthesia), precipitate labour, primary uterine inertia, a large baby, multiple pregnancy, hydramnios, syphilis, premature placental separation, placenta praevia, and true primary atony of the uterus. On the other hand, parity *per se* appeared to have no influence in this respect, and the chance of excessive bleeding was only slightly increased by prolonged labour—an interesting commentary on what is almost universally accepted teaching. The size of the baby emerges as an important factor, for with a child weighing 9 lb. or more the risk of haemorrhage was more than one in four, while with small and premature babies the corresponding figure was one in twenty-one. In order to determine the relative value of the various oxytocic drugs the loss of blood was measured after the administration of ergometrine and pituitary extract at different stages of labour. When given intravenously immediately after delivery of the head ergometrine was found to be superior, for 55 per cent. of the cases had a loss of blood of less than 100 c.cm., whereas in none was it more than 900 c.cm. With pituitrin and ergotoxin the results were by no means so good, only 28 per cent. losing less than 100 c.cm. and 9 per cent. sustaining severe post-partum haemorrhages. The value of ergometrine appears to lie mainly in its prolonged action. It induces a series of contractions in the uterus which lead to rapid and complete placental separation. The uterus then goes into continuous tetanic spasm, effectively preventing further loss. This spasm, however, may also as effectively prevent natural expulsion of the placenta, so that unless this is carried out artificially and rapidly its retention is by no means unusual, and in four of Reich's cases manual removal was needed. This possibility would therefore appear to negative the undoubted value of routine intrapartum administration of the drug, for the perfect timing of placental expression in these circumstances is obviously by no means always possible. As with pituitrin, therefore, the ergot oxytocics are of limited use before the third stage. After this, however, they have their maximum application, and seem to be definitely superior to pituitrin. Uterine tone is maintained evenly and constantly for two or three hours, the almost continuous contraction providing effectively against bleeding from the placental site. In Reich's series the amount of immediate post-partum loss fell by one-half after the routine employment of the drug, while late haemorrhages were practically eliminated. Opinion is divided as to the relative value of the two types of drug in the treatment of post-partum haemorrhage. The series quoted above strongly favours

[1] *British Medical Journal*, 1935, **1**, 520.

[2] *Amer. J. Obstet. Gynec.*, 1939, **37**, 224.

ergometrine, for this arrested the bleeding in fifty-six of sixty-two cases in which pituitrin and ergotoxin had failed. It is apparently also slightly superior when given directly into the uterus during Caesarean section. The position of ergometrine in the obstetric armamentarium has been assured since its inception, and in many clinics it has entirely supplanted pituitrin for all indications. In spite, however, of Reich's scientific assessment, pituitrin retains a place of its own, particularly in the treatment of established haemorrhage, in Caesarean section, and in other circumstances in which instantaneous action is required. The drugs are mutually supplementary, and it is unfortunate that the advantages of the older should be in danger of dropping out of sight. Ergometrine is on the whole the superior, and has rightly supplanted pituitrin as a routine prophylactic; the latter, however, is more effective in some emergencies, and must continue to hold the place to which its historic value entitles it.

CHEMOTHERAPEUTIC CALCULI

All sulphonamide compounds, though singularly free from toxic action demonstrable in animals, have proved as clinical experience widened to be capable of causing peculiar and undesirable effects in the human patient. Some of these—such as cyanosis, rashes, and "drug fever"—are common and comparatively harmless; granulocytopenia, on the other hand, is rare but dangerous. The effects mentioned may be produced by any of these drugs. That the individual compound may have its own peculiar toxic affinities is suggested by the peripheral neuritis observed during treatment with uleron; this drug is also said to cause liver damage. The toxic potentialities of sulphapyridine have hitherto been regarded as the same in nature as those of sulphanilamide, but the recent observations of Gross, Cooper, and Lewis[1] disclose another and altogether unexpected effect, evidently peculiar to this drug and attributable to its relative insolubility; this is the formation of urinary calculi, and it has so far been demonstrated only in the experimental animal. Rats were given a dose of the drug equivalent to 1 gramme per kg. of body weight by the mouth daily for fourteen days. At the end of this time or before it the majority had developed urinary calculi consisting mainly of the acetyl derivative of the drug; these frequently caused obstruction to the ureter, with consequent hydronephrosis. The renal damage demonstrable was such as might be expected in severe or complete urinary obstruction, and there was naturally a rise in the non-protein nitrogen content of the blood and retention of the drug itself. Some of these animals died before the period of medication was over; on the other hand, twelve out of a total of thirty-nine rats developed no calculi at all. So far as we are aware there is up to now no evidence of a similar effect in man, but, as these authors point out, small deposits formed during treatment with the drug might give no sign of their presence until a slow process of further accretion had greatly increased their size. It should be possible by a comparison of the solubility of the drug and its acetyl derivative in rat and human urine to determine whether the rat is at any peculiar disadvantage from this point of view, and other ways suggest themselves in which the possible clinical significance of these observations can be decided. It may well be that at least a certain minimum fluid intake is desirable in proportion to the dose given. The need for investigating this matter may even awaken interest in the general question of the cause of urinary lithiasis. We know singularly little about this subject, and it is certainly not one in which anything at all doubtful should be taken for granted.

[1] *Urol. cutan. Rev.*, 1939, May, 299.

THE HARVEY CUSHING BIBLIOGRAPHY

The world-wide distinction of Harvey Cushing and the personal affection inspired by him in Baltimore, Boston, and elsewhere were eloquently shown on the occasion of his seventieth birthday on April 8. The Harvey Cushing Society, under the presidency of Dr. Louise Eisenhardt of New Haven, has now brought out a memorial of his wonderful activity. Under the attractive title *Bibliographia animata* Dr. Arnold C. Klebs introduces the tribute with originality, and there expresses what must be the universal wish. This celebration recalls similar events in the lives of W. H. Welch and William Osler, in which Cushing played an active part. This notable and attractively produced volume contains lists of twenty-four books and monographs, 304 addresses, papers, and reports, and (perhaps the most wonderful achievement) the titles of more than 300 papers from his clinics and laboratories. The Harvey Cushing Society consists of forty-six active members, four corresponding members—G. Jefferson and Hugh Cairns from this country, Otfrid Foerster of Breslau and Herbert Olivecrona of Stockholm—and two honorary members—E. Sachs of St. Louis and Harvey Cushing himself, whose living portrait forms the appropriate frontispiece.

CURARE FOR SPASTIC MUSCLES

Curare is a drug well known to all medical students; its action is familiar to us from its frequent use in physiological experiment. Nevertheless it has been employed but little in medicine. The main reason seems to have been that in doses comparable to those employed for animal experimentation it paralyses the respiratory muscles. Some years ago Bremer[1] showed that the drug had an elective action on muscles in a state of abnormal rigidity or spasticity in doses smaller than those which affected the muscular tone of normal animals. The motor innervation of tonus and of reflex rigidity is especially made up of impulses of high frequency but subnormal amplitude; and these are more easily blocked by curare at the myoneural junction than are impulses of lower frequency. Curare is difficult to obtain and to standardize. M. S. Burman[2] was fortunate in having a supply which enabled him

[1] *Arch. Surg.*, Chicago, 1929, **18**, 1463.
[2] *Arch. Neurol. Psychiat.*, Chicago, 1939, **41**, 307.

to test the effect of the drug on human muscles in spastic-paralytic and dystonic conditions. Given intramuscularly or intravenously in doses between 10 and 40 mg., which have to be carefully adjusted to the individual patient, it quickly relaxes the hypertonic muscles. The effect is rapid but soon starts to diminish, though it may still be noticeable after two days. For therapeutic purposes the drug has to be given at least three times a week. Administration may be accompanied by transient unpleasant effects, such as giddiness, diplopia, and mild confusion. Curare in therapeutic doses does not render spastic muscles entirely flaccid, but it reduces the excessive tonus so far that passive or active movements are made possible. The paralysis as such is of course not influenced. For the maximum benefit to be obtained simple orthopaedic operations may be required, and continuous training of the muscles should run parallel with administration of the drug.

TRANSFUSION ANALYSED

Among the various indications for blood transfusion are many conditions in which only one element in the blood given is really necessary; this may be either the water, the proteins, or the red cells. Only severe haemorrhage or anaemia calls for the cells, and in secondary shock blood is given chiefly because it is the most easily obtainable fluid fully acceptable to the circulation by which blood volume can be increased. Blood without its cells would serve equally well in any case of shock unaccompanied by haemorrhage. Hence the very practical suggestion of Lehman,[1] who has the good fortune to work where a "blood bank" is available; the plasma from this stored blood is decanted and given to patients with shock, while the cells which remain are administered to those with anaemia. Another and even more thrifty idea is that of H. A. Davis and J. F. Blalock,[2] who have found it possible to use ascitic fluid in the same way. Various precautions had naturally to be observed to ensure that the transfusion of such fluid was harmless, but, on the other hand, it is said to have the important advantage of remaining suitable for use during prolonged refrigeration; how prolonged this can be is not stated. These authors not only treated cases of shock successfully, but add a further and obvious indication which involves the third component of blood we have referred to—namely, plasma protein replacement in cases of hypoproteinaemia following heavy albuminuria in nephritis. In both these papers it is emphasized that compatibility of the fluid given must be assured, as in the transfusion of blood. In both it is also stated that studies are being made of the possibility of drying plasma or other serous fluids for indefinite preservation. Were this possible on a large scale, and the product of re-solution satisfactory, there would be an alternative to the arrangements now being made for blood transfusion on an enormous scale in the event of war. Blood could be collected at leisure, and its plasma separated, dried, and stored; re-solution would then provide at any time a suitable fluid for transfusion in cases of shock. This is not as fantastic an idea as it may seem, and a time is likely to come when hurried calls for blood donors are an exception, both because stored whole blood is more generally available and because the indefinite preservation of plasma has become practicable.

[1] *J. Amer. med. Ass.*, 1939, **112**, 1406.
[2] *J. clin. Invest.*, 1939, **18**, 219.

PROBLEMS OF HIGH FLYING

Now that the performance of aircraft is improving so rapidly, and men will be called upon to fly normally at heights three or four times greater than the highest level at which they can live without special protection, the problems of this protection become more and more acute. Given the physiological data, which have by now been worked out very fully, the problem is a technical one. Professor H. Strughold of the Research Department of the German Air Ministry makes some interesting remarks on it.[1] One of the principal questions is the fate of the airman when his oxygen supply is for some reason interrupted. According to the height and the physiological characteristics of the individual he has an interval of varying length before symptoms of oxygen loss make him helpless. If he has to perform work this interval is much reduced. At heights between 8,000 and 9,000 metres it is at most two minutes resting; in practice it is often a mere matter of seconds. The airman must therefore descend to a physiological atmosphere—3,000 to 4,000 metres—within the given interval if he would avoid disaster. With open parachute a man will fall about five metres a second. He will therefore come down from 9,000 to 8,000 metres in 3 minutes 20 seconds, to 7,000 metres in 6 minutes 40 seconds, and to 4,000 metres in about 17 minutes—far too long to be of any use. A man will fall without a parachute at a rate of about 55 metres—about 183 feet—per second. This means 1,000 feet in about 5½ seconds. To survive, therefore, an airman whose oxygen supply was interrupted at 30,000 feet would have to jump instantly and fall free down to 10,000 feet, or power-dive his machine to that level, in order to survive. He would then have to cope with the effects of a very rapid increase of atmospheric pressure. Professor Strughold does not suggest a solution for the problem, but points out that a good deal of research on quantitative lines will be necessary.

[1] *Dtsch. med. Wschr.*, 1939, **65**, 281.

On March 11, 1939 (p. 514), we referred, in an article headed "Canning Before Chicago," to a paper by Professor J. C. Drummond and his collaborators on the examination of some tinned foods of historic interest, published in *Chemistry and Industry*. The International Tin Research and Development Council (Fraser Road, Greenford, Middlesex) has now issued in booklet form, with illustrations, under the title "Historic Tinned Foods," the five papers read before the Food Group of the Society of Chemical Industry on April 13, 1938. The volume may be consulted in the Library of the British Medical Association.

WAR WOUNDS AND AIR RAID CASUALTIES

The following is one of a series of lectures on the Treatment of War Wounds and Air Raid Casualties recently delivered at the British Postgraduate Medical School

WAR WOUNDS OF THE HEAD—II

BY

GEOFFREY JEFFERSON, M.S., F.R.C.S.

The Skull

The treatment of injuries to the skull is a relatively easy problem: depressions should be raised and loose fragments removed rather than replaced because of the fear of infection; calvarial defects can be repaired without difficulty at a later date. A depressed fragment is best approached through a burr-hole sunk over the sound skull 1.5 cm. from the edge of the defect; the advantage of this manœuvre is that normal dura mater can be defined with certainty, and from this start its torn edge can be identified and followed around the wound. Unnecessary

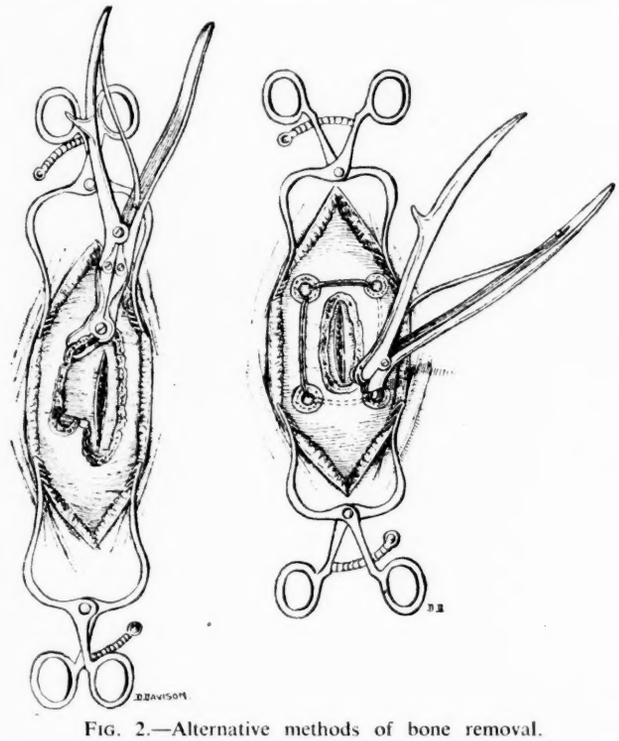

FIG. 2.—Alternative methods of bone removal.

damage to the dura is often done with the nibbling forceps if the fractured edge is attacked directly. Depressed interlocked fragments are to be removed by a block resection, burr-holes being sunk at four points in sound skull around the depression and these connected by linear cuts made with a Gigli saw, de Vilbiss or Montenovesi forceps (Fig. 2). If double-acting bone-nibbling forceps of the Stille pattern are not available it is better to use block resection. The older kinds of rongeurs jar the patient uncomfortably and make him restless. Probably the chief advantage of block resection is that it is more apt to ensure a sufficiently wide removal of the bone around the injury. A margin of at least 2 cm. should be cut all round the dural laceration.

What should be done with a linear fracture? The answer depends on another question, What are the subject's neurological signs? If there are none, and if there is no foreign material jammed in the crack, it may be left alone. But if signs are present the bone must be burred through and possibly the dura opened.

Fractures of the base with the dura torn opening into the middle ear are serious because of the danger of meningitis developing. The external auditory meatus should be swabbed clean, never syringed, and a wisp of carbolic gauze packed in very lightly; the external ear and face should be cleaned and covered with a large sterile dressing. Pneumococcal infections may arise from coincidental injury of the paranasal air sinuses. Fortunately these wounds are not common, for they are serious. It is better to remove sparingly the anterior wall of the frontal sinus if it is injured.

The Dura Mater

The question will often arise whether the dura should be opened. The reader should know now what the answer will be. If there are definite signs of intracranial damage, if the patient has localizing signs, if he has severe headache or is more stuporous than he should be, the dura should be incised. This should more certainly be done if the dura is dark blue in appearance, for this indicates blood beneath it. An incision will lead to its release and often to something more—the extrusion of pulped brain tissue. This should be washed and sucked away and then the dura closed again. Closure is important, for otherwise a superficial infection of no great virulence in itself may spread deeply. For this reason there is one important contraindication to incising the dura—namely, established sepsis in the wound. If a casualty has laid out for three or four days it will be safer not to open the dura if it is intact and to regard him as a case of potential cerebral abscess.

The Wound Track in the Brain

If good results are to be expected and no further damage done to the surrounding brain, the minutiae of the neurosurgical technique must be closely observed. The operation is planned, not to relieve, say, a hemiplegia, but to extirpate as early as possible the agents which caused it. All manipulations should be carried out very gently; the wound must not be packed with gauze. Suction is most useful when available. Cotton-wool should be used for swabbing rather than gauze, though the latter is quite permissible for scalp and bone. Heavy pressure or retraction on the brain not only causes further cerebral contusion but also sets up oedema. The meticulous avoidance of pressure and the careful sealing of vessels are two of the main differences between the technique of general surgery and neurosurgery. As the object in treating open injury to the brain is the prevention of infection by the removal of dead tissue, in-driven bone, and foreign bodies, the importance of careful radiological studies before the operation is started cannot be unduly stressed. The number of fragments removed should tally with the pre-operative count.

Theoretically, the edge of lacerated dura mater ought to be excised because it can be presumed to be infected.

Experience, however, has shown that not only is this unnecessary, but it is inadvisable, because adhesions rapidly form between the swollen cortex and dura mater: these form a natural barrier against the spread of infection into the general meningeal spaces. We should see meningitis more often if the dura mater were so widely removed that access was easy from without to the leptomeningeal spaces.

If the wound has no particular depth a superficial toilet by syringing with hot saline and the extraction of bone fragments, aided by the patient's coughing or straining to cause the extrusion of debris, is all that is necessary. If there is a deep track further steps must be taken. The aim will be to clear the track of foreign bodies and devitalized brain without inflicting damage to the surrounding part. This object is best attained by catheter suction as introduced by Harvey Cushing in 1917: a No. 10 catheter or piece of drainage tube of similar size is attached to a glass syringe or rubber bulb (Fig. 3). There is little risk of sucking out normal brain tissue, but contused brain substance is easily lifted in this way, and bone fragments will be extracted as well. A gentle search with the catheter will reveal further fragments by touch. Such as cannot be removed by it must be gently taken out with forceps. Sometimes the catheter will pass along the wound track to enter the lateral ventricle so that cerebrospinal fluid will be withdrawn in the syringe. Ventricular penetration is always a serious matter, but bone fragments can be extracted from the lateral ventricle

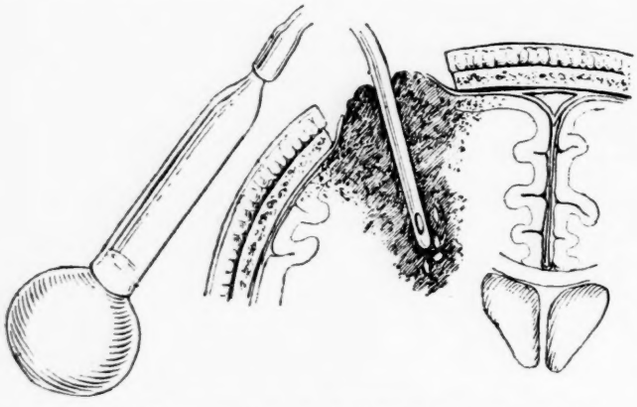

FIG. 3.—Catheter suction of devitalized brain tissue, clot, and bone fragments.

and yet the patient may recover. It is much better to know that the wound reaches the ventricle than to be too timorous and leave infected foreign bodies behind.

Retained Missiles

Shell fragments proved radiographically to be an inch or so deep can be lifted out with forceps; those with crocodile jaws are best. Deeper metal pieces are dealt with by passing a sterile metal bar down to them and applying an electro-magnet. Only four to six volts are needed for the extraction of foreign bodies of the more usual dimensions. Missiles vary in weight from 4 or 5 grammes to 50 and more, but the smaller ones are the commoner. The larger the shell or bomb fragment the more likely is it to be superficial, for those of great weight penetrating deeply usually kill.

It is quite certain that an ill-equipped surgeon will inflict so much damage in attempting to grasp the fragment that he might turn a paresis into a permanent paralysis or excite a haemorrhage which he cannot still. In past experience the missile itself has proved to be often so little infected that abscess has not formed around it (though it could do so) and it has developed a fibrous capsule within the brain. The infection is worst on the surface and least in the deeper reaches. If epilepsy develops later it will, in all likelihood, be due to the scarred track leading to the missile rather than to the latter itself. As a principle, missiles are better removed than left *in situ*; it is only with the very deeply situated ones that this is a course of doubtful wisdom: the presence or absence of an effective magnet is the factor on which the decision largely rests.

Injuries to Venous Dural Sinuses

Injuries to the large venous channels in the dura mater often prove fatal in the first hours owing to loss of large quantities of blood. In patients who survive, the repair of a lacerated sinus is always a hazardous manœuvre and of particular difficulty to those who are not practised in the surgery of the brain. Before starting the operation, muscle grafts should be taken from the temporalis if this is already exposed, or, alternatively, from the anterior compartment of the leg. Intracranial venous pressure must be lowered to its minimum by raising the head well above the level of the rest of the body, making sure that respiration is not impeded in the slightest degree and that the blood is perfectly oxygenated. If any one of those factors is acting adversely, the intracranial venous pressure rises, the sinuses distend with blood, and the bleeding becomes uncontrollably profuse. The surgeon will see to these things beforehand (including the obtaining of muscle as the first step) if a wound encroaches at any part on the surface marking of the sagittal or lateral sinuses. It is wiser then not to use the block removal method, since the elevation of the fractured area may cause an unpleasant haemorrhage. The bone over the laceration is better removed piecemeal by nibbling forceps until the tear is freely exposed in its whole length and on both its sides; it is useless attempting any kind of repair until this step has been accomplished. The type of repair will depend, of course, on the nature of the injury. If the continuity of the sinus is completely broken, each end must be encircled with fine silk thread and the ligature firmly tied. Longitudinal or incomplete transverse tears may be repaired by closing the opening with grafts of muscle, hammered into thin sheets. These Horsley muscle grafts are very efficacious, as they stick like postage stamps across the gap in the sinus, and of all the known methods they are the most easily applied and the most commonly used.

Wound Closure

A careful closure of the wound is essential if good results are to be expected: the aponeurosis should be pulled together with buried sutures of the finest silk and the skin edges opposed with great care. Catgut is a bad material for buried sutures in the scalp. It can be stated with some certainty that any wound that can be drawn together purely by buried sutures is not under too great a tension so far as the skin flaps are concerned. This is aided by dissecting them up widely by touches with the scalpel in the loose areolar layers between galea and pericranium.

It is safer to drain most wounds with narrow strips of rubber for three days. The rubber strips should be put in the extremities of the wounds and not in the centre or in positions where healing is likely to be delayed.

Raised dressings of spirit gauze built up at the periphery to take pressure off the wound are best; they should be replaced on the third day.

Epilepsy

Convulsive seizures of focal or generalized types may develop either within the first days of acute head injuries or late. The retained missile is of no particular importance in the production of these neural explosions; it is the cerebral injury that matters.

When epilepsy occurs in the early stages, as it may, the seizures are due to local haemorrhage or oedema, and may be controlled by intramuscular injections of luminal 3 grains or by large doses of bromide and chloral given orally or by rectal injection. Lumbar puncture should be done to see if meningitis is the cause; often it is not. The question of late epilepsy does not come within the scope of this discussion; suffice it to say that it can be expected in a very large proportion of cases when the dura has been perforated, and particularly when there is a cortical scar adherent to the skin. It may develop at any time after the injury, and I have known it to occur for the first time twenty years later.

Meningitis and Ventricular Infection

Although on theoretical grounds infection of the meninges might well spread widely from the site of a cortical wound and be a common cause of death, experience shows that it is relatively rare. The meningeal spaces become sealed off by oedema of the brain around the contused area and a defensive barrier arises, partly mechanical by obliteration of dead space, partly the result of sealing of blood clot (Fig. 4). When operative

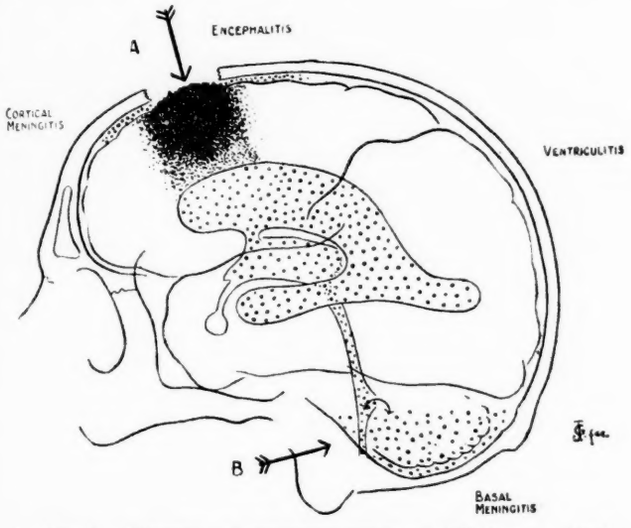

FIG. 4.—Diagram of common route of infection in head wounds. The local injury is sealed off by adhesions. (A) Local meningitis. (B) Basal meningitis, by ventricular infection escaping through the foramina of Magendie and Luschka. Fig. 4 is reproduced from the *British Journal of Surgery* (1919, 7, No. 26), by kind permission of the editor and of the publishers.

cleansing of the wound is undertaken reasonably early this barrier is sufficiently effective to prevent major disaster. The presence of leucocytes and even polymorphonuclear cells in the cerebrospinal fluid is no indication that a fatal meningitis is established or even on the way. Pleocytosis of this kind will often subside without its ever having been possible to grow organisms from the fluid. Even when there is bacterial infection death does not necessarily follow, though it of course signifies a grave condition. Experience taught me that the worst examples come from a deeply extending septic encephalitis that infects the ventricle. Once this has happened the cerebrospinal fluid circulation washes the organisms widely through the ventricular system and will carry them to the full extent of the leptomeningeal spaces. The majority of these patients die. The moral lies in the need for a most careful cleansing of the wound and the avoidance of any rough, and particularly any blind, procedures carried deeply into the cerebral tissues.

The treatment of meningitis consists in repeated lumbar punctures (two or more daily) or continuous lumbar drainage by keeping the needle *in situ* for two, three, or more hours, aided by chemotherapy. The last is the most important of all.

Cerebral Fungus

If a wound does not heal by first intention, and especially if the scalp has been closed under undue tension, the edges of the wound will part in the middle and a cerebral fungus develop. This should be carefully protected by a raised dressing built up some distance from the circumference of the wound. If the infection is limited and the injury very localized no great protrusion will occur. On the other hand, if there is a large defect in the skull and scalp the fungus may attain considerable size. It always indicates encephalitis, and its proper treatment is by means of antiseptic drugs by mouth and by repeated lumbar puncture. The old method of shaving off the fungus is to be condemned unconditionally. The ventricle herniates towards the fungus and may be opened by injudicious surgery. Lumbar puncture will always reduce a fungus; it may have to be repeated two or three times a day, or the needle may be left *in situ* for an hour or more. By the use of whichever of the modern antiseptic drugs or sera seem best adapted to deal with the infection, the encephalitis will subside in most of the subacute cases and in some of the worse ones. Possibly the importance of the sulphonamides in the treatment of these injuries has not been sufficiently impressed in these lines. Even though most war wounds are infected with organisms of more than one type, and with some not yet proved to be specially susceptible to the new drug, we have some grounds for hope. Sulphapyridine (M & B 693) should be especially useful in the cranio-facial injuries that did so badly in the last war because of pneumococcal infection, but it will be best if it or some allied compound is given immediately as a prophylactic to all wounds.

In the early stages the picture is that of an unhealed wound; but, if all goes well, granulations appear and cover the fungus, which will eventually epithelialize. Some months later a plastic operation may have to be considered.

Conclusion

Head injuries are most interesting wounds; the difficulty is that in war time they may have to be dealt with in such numbers. There is no special merit in very slow operating, nor is there any merit in great speed here, for it cannot be combined with the other requisites. Most of the operative steps outlined can be performed in little over half an hour, exclusive of the shaving of the head, the positioning of the patient, and local infiltration of novocain. It is a mistake to assume that the urgency of operation is so great that all surgical ideals should be discarded. There are now enough neurosurgical centres, and technique is so standardized that all likely to have

to deal with these war wounds can obtain an introductory training which would fit them to do so.

There is one last point, and that is the value of keeping the patient in the hospital where he has been operated upon for at least ten days afterwards. The results are better if this can be done, not only because travelling upsets the patient, but chiefly because some continuity in treatment is of the greatest importance. It is naturally extremely difficult for a fresh group of people to understand the exact nature of a lesion hidden beneath a newly sutured scalp.

I wish gratefully to acknowledge the assistance of Mr. G. F. Rowbotham in the preparation of this paper.

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HEALTH ADMINISTRATION IN ZANZIBAR

The annual medical and sanitary report for 1938 of the Zanzibar Government deals with the island of Zanzibar and the adjacent island of Pemba. The population, a cosmopolitan one comprising Europeans, Indians, Arabs, and Africans, is estimated at 241,500. Birth and death rates for the year were approximately 14 and 21 per cent., while the rates of infantile and maternal mortality were estimated at 275 and 9.2 per thousand live births. With regard to climate, the mean temperature in Zanzibar town has been 80° F. over a long period of years, with an average daily range of some twelve degrees; the rainfall for 1938 was 73.8 inches. Pemba is very slightly cooler and somewhat wetter. Health administration is controlled by the Director of Medical Services, under whom are one senior medical officer, eight medical officers, and seven sub-assistant surgeons. There are also certain specialist appointments.

Ankylostomiasis and Malaria

With regard to diseases the report comments on the comparative frequency of duodenal ulcer, stating that no age, after the twentieth year, appears to be exempt from it. Some cases of advanced ankylostomiasis, which is widespread, showed, on hospital investigation, a hyperacidity highly suggestive of duodenal ulcer. The patients complained of pyloric pain, but *x*-ray examination revealed no positive evidence. With the improvement in the blood condition, which followed hookworm treatment, the hyperacidity decreased. As this occurred in every case, it seems probable that useful inferences may be drawn from a larger investigation. In the previous report it was estimated that roughly 98 per cent. of the population suffered from ankylostomiasis, 9 per cent. showing clinical signs of the disease. Arrangements have been made for the provision of large numbers of cement-covered pit latrines, and by the extension of this measure, together with intensive propaganda, it is hoped in time to diminish the high rate of infestation.

Anti-malarial work is beset by many difficulties. Until recently some 1,500 head of cattle were housed and permitted to graze in the town of Zanzibar. Their hoof-prints provided a large proportion of the anopheline breeding places. Myriads of anopheles bred in wells, which, of course, could not be oiled, while the "millions" fish put in to eat the larvae were themselves caught and eaten by small boys. The extension of the piped water supply has greatly diminished this danger. Although it has been possible to apply anti-malarial measures to swamps and marshes within half a mile of the town boundary, expense has prohibited control over a wider area, whence large numbers of anophelines are carried into the town by the prevailing strong wind during the rainy season. Culicine and stegomyia mosquitos present a still harder problem. Sewage in cess pits becomes so much diluted during the rains as to allow the insects to breed, and numerous breeding places are available in holes in trees and domestic receptacles for water storage. The report notes that more larvae are found proportionately in the houses of the more prosperous Arabs and Indians than in the poorer quarters of the town.

Avitaminosis, manifesting itself in most cases as polyneuritis, especially of the lower extremities, is very common among people living in villages. Following the visit to Zanzibar of an expert on nutritional problems, measures are being devised with a view to the improvement of the dietary of the natives.

HOSPITAL CONGRESS AT TORONTO

Arrangements are now completed for the sixth biennial Congress of the International Hospital Association, to be held at Toronto on September 19 to 23, and given favourable world conditions this gathering should be the largest and most influential that has ever assembled in the history of hospitals. Delegates will arrive by various routes from all quarters of the globe, but naturally the larger number will come from the United States and Canada. All will be ready for the Pageant of Nations in Toronto on the evening of Tuesday, September 19. Forty study committees will be reporting, and on such diverse subjects as hospital construction, transport of patients, mechanical plant, spiritual care of the sick, the child in hospital, hospital libraries. An international language service in an ear-phone system is to be installed in the ballroom of the Royal York Hotel, the headquarters of the Congress, and the listener, by merely turning a switch, will be able to hear in one of the following five languages: English, French, German, Spanish, and Italian. The Congress of the I.H.A. will be followed by conventions of the American Protestant Hospital Association and the American Hospital Association. The party of delegates from Great Britain, Northern Ireland, and Eire travel in the C.P.R. liner *Duchess of Atholl*, leaving Liverpool on September 8, and will see hospitals in Quebec, Montreal, Ottawa, and Toronto. The return tour will be through the Eastern States of U.S.A., and again many other hospitals will be visited, and a final touch will be a tour of the "World's Fair" in New York. Further information may be had from Mr. W. McAdam Eccles, F.R.C.S., 104, Bryanston Court, London, W.1.

PROTECTION OF CIVILIANS IN WAR

An international medico-legal conference was held at Liége at the end of June to consider the subject of protection of the civil population in time of war. The discussions were presided over by two distinguished legal figures and the Professor of the Faculty of Medicine in Liége. The value of international conventions for the protection of the civil population was emphasized by Professor de la Pradelle of Paris, who based his claim on the history of the various movements which owed their origin to such conventions. Dr. Decharneux described in detail the medical organization of a mobilized country, emphasizing the necessity for co-operation between the health services of the army and those of the civilian authorities. He outlined the difficulties of national medical mobilization, and proposed a series of solutions which required urgently to be considered by the responsible authorities. These were concerned with the organization of the medical profession throughout the land, the employment of women medical practitioners, the organization of laboratories and of campaigns against epidemics, and the need for international agreement on the safeguarding of medical and public health services in occupied territories. It was also urged that civilian medical practitioners should receive instruction in military medicine and pathology. Dr. Moureau considered that the co-operation of the health services of the army, of the Government's public health services, and of such bodies as the Red Cross Society should be sought to secure co-ordination of the blood transfusion services. The Belgian Government called a conference shortly after the medico-legal one had finished its programme, and a commission was appointed to consider the practical details of such co-ordination.

ONE HUNDRED AND SEVENTH ANNUAL MEETING

of the

British Medical Association

HELD IN ABERDEEN, JULY, 1939

THE SECTIONS

SUMMARY OF PROCEEDINGS

During the next few weeks there will be published in the BRITISH MEDICAL JOURNAL *most of the opening papers communicated to the Scientific Sections of the Annual Meeting at Aberdeen. The reports of discussions, concluded from last week (p. 365), are intended to give members who were not present a general idea of the proceedings.*

SECTION OF MEDICINE

Friday, July 28

Immunization against Infectious Fevers

With the President of the Section, Professor A. G. ANDERSON (Aberdeen) in the chair, the discussion on prophylactic immunization against diphtheria, whooping-cough, measles, scarlet fever, and influenza was opened by Sir JOHN LEDINGHAM, F.R.S. He considered that of the five diseases under discussion diphtheria merited most attention because of the toll it took of child life and because it had been shown in some countries that active immunization might reduce the morbidity to zero. Lack of unanimity on the best antigen or the best method of administration should not be allowed to hold up schemes of immunization. There were many elaborate studies of these antigens—principally formol-toxoid (F.T.), alum-precipitated toxoid (A.P.T.), and toxoid-antitoxin floccules (T.A.F.). An analysis of these suggested that either three injections of F.T. or of T.A.F., or two injections of A.P.T. at intervals of at least a month, would result in great reduction of the incidence of diphtheria among the immunized. Probably three doses of A.P.T. would be the most effective, or one dose of A.P.T. followed by two of F.T. or T.A.F. It was well established that the dose interval, particularly between the first and second doses, should be long rather than short. Although the initial aim must be to immunize as many school children as possible, the ultimate goal must be to secure immunity for a maximum number of children between the ages of 9 months and 2 years. A reinforcing dose would be desirable when such children entered school. Only when 80 per cent. of children had been immunized would the morbidity be influenced.

With reference to whooping-cough, Sir John thought that efforts at immunization demanded further exploitation. Recent work, particularly in the U.S.A., supported the view that vaccines from smooth organisms could confer a considerable degree of protection against pertussis. Children might be eventually immunized with a mixed vaccine of smooth pertussis organisms and diphtheria toxoid, as Ramon had demonstrated that the addition of T.A.B. vaccine to his diphtheria "anatoxine" in no way altered the efficiency of either element.

Dr. D. W. BERRY (Aberdeen), describing methods of immunization against scarlet fever, said that the total dosage should be large—perhaps 20,000 skin test doses, although greater amounts were sometimes used. Five injections were given at weekly intervals, the dose being increased twofold or threefold at each injection. While Dick-negative reactors were much less liable to scarlet fever than Dick-positive reactors, many scarlet fever patients had been Dick-negative before infection. The protection conferred was against the effects of exotoxin, but there was no anti-bacterial effect against the spread of streptococci to the throat or elsewhere. Difficulties of large-scale immunization against scarlet fever were the necessity for several injections, the reluctance of parents to give consent, and the failure of Dick-testing and immunization to control the disease. However, the results were not without promise, especially in those closely exposed to risk, such as the staffs of fever hospitals, among whom scarlet fever had practically disappeared on the introduction of active immunization. A better way of immunizing susceptibles might yet be found, and further statistics might show more clearly the value of the method.

Dr. WILLIAM GUNN told of the arrangements in London for the preparation, storage, and distribution of measles immune serum (convalescent, normal or adult, and placental extracts). Stocks tended to be low when needed most—at the beginning of epidemics, which recurred in large centres of population at two-yearly intervals—and high towards the end, when opportunities for its use became fewer. Serum left over from a previous epidemic tended to lose its protective potency even when stored under proper conditions. By drying the serum to powder its potency might be maintained indefinitely; when required the serum could be reconstituted by addition of physiological saline in such volume as restored the protein to its original concentration. While no immunization could be produced by animal serum, temporary protection could be readily conferred by human immune serum. If a subprotective dose was given a modified attack and resultant immunity would usually ensue. Deliberate exposure to infection to secure attenuation was not generally advisable; it was better to aim at protection rather than attenuation in young subjects, especially those under 3 years of age, and in the weakly or debilitated. None of the reactions sometimes seen after animal serum happened with the use of human serum. Dr. Gunn mentioned the occurrence of toxic hepatitis after injections of human sera. There had been a case fatality of 20 per cent., and although epidemic jaundice was present in several centres at the time a causal relation must be presumed.

Dr. C. H. STUART-HARRIS referred to the assessment of the prophylaxis of influenza by Andrews and himself at the Section of Pathology in 1937. They had attempted to differentiate outbreaks which did not yield influenza virus ("febrile catarrhs") from the one epidemic in 1937 which yielded virus from a high proportion of garglings. This classification failed to help this year in the investigation of twelve localized outbreaks diagnosed as influenzal. In these the virus was recovered in only seven out of eighty-nine garglings, but serological evidence of virus infection was found in one-third of the sera collected from the various epidemics. It was impossible to judge clinically which patients would yield evidence of virus infection. The incidence of pneumonia was high in 1937, corresponding to a large percentage of garglings containing virus, whereas in 1939 a low pneumonia incidence was accompanied by a low frequency of virus in garglings. It appeared that each outbreak consisted of a few cases of epidemic influenza and a large number of cases of some clinically similar but aetiologically different infection. One of these outbreaks took place in a naval establishment, where a group of 480 boys had been vaccinated with a formolized influenza virus vaccine. While there was insufficient evidence to condemn this method, the results so far were not encouraging.

Dr. H. J. PARISH (Beckenham) shared the opener's dissatisfaction with the present position of preventive inoculation against diphtheria in this country. When properly prepared A.P.T. was the most efficient antigen available; T.A.F., the mildest of all preparations and also very efficient, was now being made with refined instead of with ordinary concentrated antitoxic serum. The length of interval between injections was more important than the size of dosage. To prevent occasional mild diphtheria in Schick-negative reactors all "natural" negative persons might receive one dose of prophylactic at the time of the Schick reading. To obviate "relapse" from Schick-negative to Schick-positive one or more injections per year of T.A.F. were given to nurses in some hospitals. Children who had two doses of A.P.T. in infancy might be given a third dose at the time of entry to school, and possibly a fourth dose at the age of 9 years. With regard to whooping-cough vaccine, it might be an

advantage to lengthen the interval between injections, as had been suggested for diphtheria immunization. Restimulation after a year or so—possibly with a very small dose—might induce a marked "secondary stimulus" response and a high level of antibody. Dr. MAULE HORNE (Poole) summarized the practical results of the application in the field of the laboratory findings of Dr. Parish and his associates. Referring to immunization against diphtheria, he emphasized the importance of an interval between the doses of A.P.T., four weeks being the optimum.

In reply, Sir JOHN LEDINGHAM said that diphtheria immunization was the most important branch of this subject at the moment. What had to be aimed at was the mass immunization of school children, and he would have liked to have seen greater numbers of public health officers at this discussion, to indicate the practical difficulties which had to be met in educating and persuading the public. In this country the morbidity had not so far been influenced at all.

SECTION OF SURGERY

Friday, July 28

Varicosities of Veins

With Professor J. R. LEARMONTH (Aberdeen) in the chair, Professor LAMBERT ROGERS (Cardiff) opened a discussion on the choice of treatment and end-results in varicosities of veins. Professor Rogers's paper on varicose veins of the lower extremity and varicocele is published in this issue at page 383.

Haemorrhoids

Mr. W. B. GABRIEL dealt with haemorrhoids. He stressed the need for clear recognition of the differences between internal and external piles and between the three degrees of internal piles. In the first degree there was bleeding at defaecation but no prolapse. In the second degree there was prolapse at stool and perhaps bleeding, but spontaneous return within the anal canal at the end of the act. In third-degree piles there was prolapse at stool and digital replacement was necessary, but prolapse also occurred on ordinary exertion. There was great need for general examination and for proctoscopy and sigmoidoscopy in all cases to eliminate other associated ano-rectal conditions. Regarding treatment, Mr. Gabriel believed that excision of a solitary tense anal haematoma under local anaesthesia was a very satisfactory operation. The large conglomerate anal haematoma was best treated on expectant lines. Skin tags at the anal margin might subside with lead lotion compresses, but if large were best excised under local anaesthesia. When associated with prolapsing internal piles a formal haemorrhoidectomy was best. Three main lines of treatment for internal piles were in routine use at St. Mark's Hospital. Palliative measures were used for certain cases of generalized rectal congestion and for thrombosed or infected internal piles. Injection treatment was used for first- and second-degree piles. The injection solution most to be commended was 5 per cent. phenol in almond oil. The ideal treatment for all third-degree piles was operation by the modern ligature method described by Milligan and his co-workers. This was based on an accurate recognition of the anatomy of the region. From a surgical point of view the operation was done more easily under local or low spinal analgesia than under a general anaesthetic. By adoption of the correct technique and proper after-treatment a safe and rapid recovery ensued, so that practically no upper age limit need be recognized.

Mr. E. T. C. MILLIGAN gave a report of the end-results of 200 cases of haemorrhoids, collected by Mr. J. C. Stewart at St. Mark's Hospital, treated by sclerosing injections. This showed that first-degree piles were cured in 98 per cent. of cases, but the method was uncertain in 25 per cent. of second-degree cases and ineffective in third-degree cases, where operation was necessary for cure. He pointed out that the main fixation structure of the haemorrhoid was the longitudinal muscle, which grasped the pile at its middle. When this was absent, weak, or stretched, sclerosing injections, which only replaced the secondary fixation structures, could not effect a lasting cure. Mr. Milligan then described in detail the ligature operation as now performed.

Treatment of Varicose Veins

Mr. PHILIP TURNER agreed with Professor Lambert Rogers that excision of varicose veins was often desirable, especially when the trouble was strictly localized. The cause of the varices was usually obscure. He suggested that in some cases there was a slight degree of obstruction present at the saphenous opening due to (1) tension of the inferior cornu of the saphenous opening in the erect posture; (2) tributaries near the end of the vein in which the flow of blood was from above downwards; and (3) the presence of an enlarged lymphatic gland in the angle between the internal saphenous and femoral veins. In suitable cases, after local treatment had been carried out, these factors could be eliminated by operation.

Mr. J. B. OLDHAM (Liverpool) endorsed Professor Rogers's plea for conservation in the treatment of varicocele. In varicose veins he practised a combined ligature and injection procedure, passing a ureteric catheter down the vein and injecting 20 per cent. sodium salicylate as the catheter was withdrawn. This produced a greater length of sclerosis.

Mr. H. J. MCCURRICH (Hove) thought that better results were to be got in varicose veins by injection if the "empty vein technique" was followed. The needle was inserted into the vein low down, the limb elevated, and the sclerosing fluid injected into the emptied vein. The walls of the vein were then kept in apposition by elastoplast and firm bandaging. If the walls thus chemically inflamed could be got to adhere one did not get the thickened cord of a thrombosed vein, and the chance of recanalization was less.

Mr. G. GORDON-TAYLOR said that with a Trendelenburg operation, properly done, the results were excellent. But the vein had to be tied close up to the femoral vein and not just at the saphenous opening. Mr. Gordon-Taylor also deprecated the operative treatment of varicocele.

Mr. J. H. F. JAYASURIYA (Colombo) said that in Ceylon varicocele was not uncommon in adults. In the majority of cases it was complicated by lymphangiectasis, and the aetiological factor in the latter was filariasis. In every case of varicocele in countries where filariasis was prevalent blood examination for microfilaria was necessary. In this type of varicocele, although expectant treatment was primarily adopted, the patients had to be under strict observation on account of the common complication of suppurative thrombophlebitis and septicaemia.

Radiotherapy and Surgery for Cancer

Following the main discussion three occasional papers were read. Dr. RALSTON PATERSON spoke on the relation between radiotherapy and surgery in the treatment of cancer. He first referred to Sholto Mackenzie's three groups of malignant disease as to the percentage of cases receiving treatment, and said that on a subjective survey he (Dr. Paterson) found a close approximation into what he called "curable," "treatable," and "incurable" cases. The "curable" group included malignant disease of the uterus, skin, breast, mouth, tongue, and lip. In this group, where adequate treatment facilities existed, cure was being achieved in an appreciable percentage of all cases occurring. "Treatable" malignant disease included that of stomach, intestine, prostate, rectum, bladder, ovary, and larynx, but from the point of view of cure all had to be discovered at an early stage. Not being so apparent or easily palpable as in the first group, the percentage of early cases was small.

Passing to the relative merits of surgery and radiotherapy, Dr. Paterson divided the types into groups where radiotherapy was usually contraindicated (stomach, colon, rectum, the connective tissue sarcomata, and most advanced malignant disease), where radiotherapy was of some, but limited, value (pharynx, larynx, bladder, prostate, oesophagus, lung, mediastinum, and brain), where radiotherapy was the treatment of choice (tumours of high sensitivity and tumours of

limited sensitivity in accessible sites), and where surgical extirpation and radiotherapy were both of value. Dr. Paterson concluded by expressing the opinion that, considering only the knowledge and the facilities at our disposal at the moment, greater immediate achievements were likely by more simplified methods of education and propaganda for the early treatment of the accessible cancers than by any visible promise of accomplishment in the technique of treatment, surgical or radiotherapeutic.

Plastic Facial Surgery

Mr. A. H. McINDOE spoke upon plastic surgery, with special reference to the primary repair of facial injuries. He said that efficient early treatment would obviate many of the plastic surgeon's difficulties at a later date. With reference to injuries limited to the soft tissues of the face he stressed the importance of the removal of all foreign material and coaptation of lacerations, using fine needles and sutures. Where there were fractures without soft tissue injury replacement of displaced bones was relatively easy at an early stage, whereas, if neglected, much difficulty might be experienced after an interval. He illustrated the methods used and the various fractures of the malar and nasal bones and in the upper and lower jaw, the results chiefly of motor and aeroplane accidents.

Dr. W. McK. CRAIG (Mayo Clinic, Rochester, U.S.A.) gave a paper on the surgical treatment of hypertension, and followed it by an illustrative film.

SECTION OF OBSTETRICS AND GYNAECOLOGY

Friday, July 28

Psychology of Pregnancy

With Professor DUGALD BAIRD (Aberdeen), Vice-President of the Section, in the chair, the session was devoted to the reading of occasional papers.

Mr. M. W. B. BULMAN (Norwich), in a paper on the psychological aspects of pregnancy and labour, said that it was important to know the behaviour pattern of the woman so that her attitude to labour could be forecast. In pregnancy fear was the most predominant emotion. Fears were rational or irrational, the latter being induced by dramatic accounts of difficult labours given by friends or neighbours. Intuitive fear was associated with abnormal labour. The patient realized that the labour was not quite normal, so that abnormal tension was automatically accompanied by general physical tension, and the latter still further increased the obstruction to delivery. In most cases of hyperemesis there was a psychological element. A detailed analysis in these cases was not advisable. The beneficial effect of morphine was due to the resulting mental and physical relaxation. In any case of slow dilatation with no malpresentation or obvious disproportion a psychological element could be assumed. It was suggested that disordered uterine activity was primarily psychological in origin, in which case under-activity of the uterus tended to occur in persons who had a general psychological tendency to postpone decisions in a crisis or on occasions of stress; while over-activity tended to arise in those whose habit was to rush their fences or to get over as quickly as possible an unpleasant situation. Delay in the second stage was rarely, if ever, of psychological origin. During pregnancy the patient's confidence must be gained and fears put into her mind by stupid friends, relations, or midwives removed. Physical relaxation should be taught. Sedatives in labour were of the utmost value.

Professor BAIRD referred to the interrelationship of psychological and hormonal influences in disordered uterine action. Professor R. W. JOHNSTONE (Edinburgh) mentioned the interaction between emotion and anterior pituitary function. It was interesting to note the synergistic and intensified effect of morphine in combination with an adequate dose of reassurance. Dr. H. C. McLAREN (Glasgow) noticed in Berlin that parturient women had no analgesia or anaesthesia. They seemed to show little anxiety. Dr. G. W. B. JAMES, speaking as a psychiatrist, agreed with the liberal administration of sedatives. He was against bromides. Dr. J. H. STEPHEN (Aberdeen) described a case of anxiety in which psychological advice was given and an easy confinement resulted. Professor JAMES HENDRY (Glasgow) emphasized the importance of the ante-natal period for the doctor gaining the confidence of the patient.

The Premature Infant

Dr. V. MARY CROSSE (Birmingham), in a paper on the premature infant, described the results of treatment of 1,400 babies between 1931 and 1938. Of these 55 per cent. were less than 4 lb. and 95 per cent. less than 5 lb. in weight. Of these 63 per cent. had lived. These results had been obtained by paying strict attention to certain characteristics of the premature baby—that is, its low vitality, poor heat-regulating centre, the difficulties in feeding, and liability to cyanosis, infection, and certain diseases. Air in the ward was kept at 70° F. by means of a gas fire and central heating. Humidity was kept at 60–65 per cent. by steam kettles. Hot-water bottles were as effective as electric blankets. Heat stroke was a real danger, and the heat in the cot should not be above 90° F. The babies were clothed in pure flannel, and for the very small babies only oil was used. This was followed by a water bath once every three days when they were stronger. Those babies that could suck were put to the breast or given expressed breast milk in a bottle. In those unable to suck, oesophageal feeds, with a Jacques catheter No. 4, replaced stomach feeds. When breast milk was not available substitutes had to be given. It was a safe rule to say that a baby should be taking 2 oz. per lb. body weight daily at the age of 7 to 10 days (one-seventh of body weight) and 3 oz. per lb. body weight daily by the age of 2 weeks (one-fifth body weight). In very small children thyroid extract (one-tenth grain per lb. body weight daily) was given. Cyanosis was treated with CO_2 in oxygen. Masks were always worn by nurses. The infants had been carefully followed up after leaving hospital, and it was interesting to note the following mortality rates at the end of the first year: breast-fed, 4 per cent. dead; partly breast-fed, 6 per cent.; artificially fed, 10 per cent. The all-important thing in treatment was good nursing.

Professor BAIRD said that premature babies were best treated in hospital, and those weighing over 3 lb. stood a chance of survival. Mrs. EMILY BROWN (Mukden) mentioned the combination of oedema and jaundice in premature infants whom she had had to treat in China. Dr. E. K. MACKENZIE (Tain) stressed the danger of dehydration. In premature babies the eighth to ninth month after birth was the danger period. It was then that they so readily picked up infections.

Radium in Innocent Gynaecological Disorders

Dr. ELIZABETH HURDON (Exeter), in a paper on this subject, dealt with dosage in the radium treatment of metropathia haemorrhagica and the haemorrhage associated with small fibroids. Before irradiation the uterus was curetted to exclude malignancy. Radiation had sometimes been given in cases of unsuspected gestation. A high ratio of abnormal offspring had resulted. Intensive radium application was not free from danger: ulceration, pyometra, and pelvic inflammation might follow. Radiation in the young woman was a problem. In older women the minimum effective dose to stop menstruation was the principle of treatment.

Mr. FRANK COOK submitted that, from a physiological standpoint, hysterectomy was less mutilating than the application of radium in cases of functional menorrhagia in young women in whom endocrine treatment had failed. Mr. V. B. GREEN-ARMYTAGE said that radium therapy destroyed ovaries but preserved a potentially dangerous uterus. In young people resection of two-thirds of both ovaries would stop bleeding for six months. Mr. ERIC STACEY (Sheffield) urged the use of minimal rather than maximal doses in young women. Partial resection of ovaries he had also found beneficial. Professor R. W. JOHNSTONE observed that in women of mature years but under 40 he preferred a high subtotal hysterectomy if hormone treatment failed.

Infertility

Dr. G. P. MILNE (Aberdeen) based his observations on fifty-three cases of infertility treated in 1938. Some 10 to 15 per cent. of marriages were childless. Before any extensive investigation of the wife was undertaken the husband was examined. The woman was found to have genital hypoplasia in 26.4 per cent. of the cases. The biopsy curette was always used, and anovular menstruation was found in 18.6 per cent. of cases. In 18 per cent. of women tested for tubal potency the tubes were blocked. In suspected cases of hypothyroidism a B.M.R. estimation was done. The vaginal *p*H was 4 to 4.4 and did not vary even in the presence of genital hypoplasia. Seminal fluid was examined as to its volume, *p*H, motility, morphology, and spermatozoal count. A count below 60 million per c.cm. was an indication of infertility. The *p*H never varied much from 8. Morphological abnormalities stressed were the variations in size and detachment of the head from the tail: 43 per cent. of the men had counts of 60 million or over, and in 29 per cent. the counts were below 30 million. Hormone therapy was given to women with genital hypoplasia. Thyroid was prescribed in some cases. Artificial insemination was tried in one case, but unsuccessfully. Up to date the results were a pregnancy rate of 11.3 per cent. Relative infertility in the male was more common than formerly thought.

Mr. GREEN-ARMYTAGE deplored curettage in cases of sterility. He thought lipiodograms were much more valuable than insufflation. Thyroid was of value in the treatment of husbands. Mr. FRANK COOK suggested the use of follicle-stimulating hormone in cases of anovular menstruation.

In the afternoon films were shown of a lower segment Caesarean section operation by Mr. GREEN-ARMYTAGE and of a vaginal hysterectomy by Mr. M. M. DATNOW (Liverpool).

COMBINED SECTIONS OF SERVICES AND TROPICAL MEDICINE, WITH PUBLIC HEALTH

Friday, July 28

Leptospirosis

Lieutenant-General Sir WILLIAM MACARTHUR presided over a joint meeting of the Section of Public Health and Hygiene and the Section of Services and Tropical Medicine, when Professor L. S. P. DAVIDSON (Edinburgh) and Dr. J. SMITH (Aberdeen) opened a discussion on leptospirosis.

Professor L. S. P. DAVIDSON stated that 24.3 per cent. of the Aberdeen fish-workers had positive agglutinins against the leptospira, and of the 248 accurately diagnosed cases of Weil's disease in Great Britain 109 had been in fish-workers. Infection might be (1) mild, with insignificant or absent symptoms, (2) moderate, with influenzal symptoms and no apparent jaundice, and (3) severe. The onset was sudden with fever, headache, vomiting, generalized pains, conjunctivitis, and albuminuria; jaundice was rarely seen before the third day, and if delayed for a week the case was mild. There was a neutrophil leucocytosis, the icteric index was raised, and the blood urea was generally increased. Moderate cases improved during the second week, but in severe cases convalescence was prolonged and secondary fever might appear in the third week. Meningitis was present in 10 per cent. of cases, but leptospirae were not recovered from the fluid. The mortality in Aberdeen was 5.7 per cent., and was worse in the aged and in alcoholics. The simple precautions recommended to the fish trade in 1934, such as hosing down the premises each morning and the use of hypochlorite disinfectants, did not seem to have been observed. For treatment, anti-leptospiral serum was valuable if given early. Glucose and alkaline mixtures were also useful.

Dr. J. SMITH said that patients' blood was infective for guinea-pigs up to the fourth day of the disease, but rarely after the eighth, whereas agglutinins were not demonstrable before the third day, but were always present after the ninth. In four cases neither organisms nor agglutinins were found between the fifth and the eighth day, while in three cases positive agglutination tests and blood cultures overlapped—a rare combination. Organisms were never found in the urine in the first week of the disease, but were present in 21.5 per cent. of cases in the third week, and disappeared after the fourth. During convalescence agglutinins were found in the urine. Immune bodies persisted in the blood for years after infection. Of 210 fish-workers tested fifty-one gave positive agglutination tests—fifteen positives occurred in forty-seven persons with a history of jaundice, eighteen in forty-eight persons who had only had a febrile illness, and eighteen in 145 persons with no history of any disease.

Dr. J. M. ALSTON gave a detailed analysis of the circumstances in which infection by *Leptospira icterohaemorrhagiae* had taken place in 259 persons in Great Britain from July, 1933, to July, 1939; over 80 per cent. of these infections were considered to have arisen in fish work, coal-mining, sewer work, or from bathing in fresh water. The disease occurred in ninety-eight out of 104 instances in fish-workers in Aberdeen, and in forty out of forty-six instances in sewermen in London. Among 1,000 London sewer-workers the number of infections detected in each of the years 1934 to 1938 inclusive was five, eight, five, six, and ten respectively, and six of the thirty-four died. Infection was more frequent in the building-workers who handled broken and slime-covered brickwork at the bottom of the sewers than in the flushers who cleaned the sewer walls. Most of the employers of sewer-workers (local authorities and public works contractors) gave the men a card or book which instructed them in useful methods of hygiene and which was to be shown to any doctor who attended to the workmen, so that the possibility of leptospiral infection might be realized. A doubt arose in the interpretation of leptospiral agglutination when anti-leptospiral serum had been given. An experiment with rabbits showed that when anti-serum was injected the titre of the animal's serum fell rapidly below the theoretical value the serum might produce. The macroscopic test with formolized antigen might sometimes give false positive results. Dr. T. FERGUSON (Edinburgh) said the disease was made notifiable in Scotland in 1924, and of some 558 notified cases more than 200 had been confirmed. Cases occurred chiefly among fish-workers, coal-miners, sewer-workers, farm labourers, and bathers. The Court of Session in Scotland in 1926 held that the disease might be covered by the Workmen's Compensation Act as an industrial accident. Dr. F. MURGATROYD stated that valuable clinical signs were muscular tenderness, conjunctivitis, and polymorphonuclear leucocytosis, particularly in those exposed to risk. In cases in which infection was probable it was justifiable to give serum while awaiting laboratory confirmation of diagnosis. Although prophylactic vaccination was promising in animals, its application appeared less satisfactory in man. Dr. R. D. STUART (Glasgow) suggested that epidemics had occurred in coal-pits. In sewer-workers the disease was severe, but in tripe-scrapers only mild, the majority being wrongly diagnosed as cases of influenza. Vaccination might be useful for sewer-workers. The disease had also been observed among labourers in the beet fields in Ireland. Dr. J. J. PATERSON (Maidenhead) asked about the mechanism of infection. Dr. P. H. MANSON-BAHR suggested rubber gloves for the fish-workers. He found splenomegaly rare. Professor J. W. MCNEE (Glasgow), speaking of cases seen during the war, said infection probably took place through the alimentary tract. Jaundice developed on the fourth or fifth day, splenomegaly was absent, and haemorrhagic herpes was strong evidence of Weil's disease.

In reply, Professor DAVIDSON said that fish-workers were probably infected through abrasions on the hands. Dr. SMITH suggested that cases should be sought for among the fish-workers in Hull and Grimsby.

Diagnosis of Enteric

Lieutenant-Colonel J. S. K. BOYD, in an occasional paper on laboratory methods in the diagnosis and control of the enteric group of fevers, said that anamnestic rises of typhoid H titres in inoculated persons might occur with various other

fevers, while O titres in true infections might only develop slowly. Therefore determination of Vi agglutinins was valuable in diagnosis and also useful in the detection of permanent carriers. The method was applicable so far only to *Bact. typhosum* infections, but the technique had been simplified by the use of strains possessing only Vi antigen. He went on to say that bacteriophages had been isolated which readily became conditioned against various strains of *Bact. typhosum*, and since the phage type of the bacterium was unaltered by culture or passage through man the lytic powers of these phages could be used in the identification of strains of organisms. Thus the relationship of different infections might be determined. The method had important epidemiological applications.

Dr. R. D. STUART (Glasgow) raised the question of O agglutinins in Salmonella infections. Professor C. P. BEATTIE (Baghdad) discussed the occurrence of O agglutinins after T.A.B. inoculation and in normal persons. Dr. P. H. MANSON-BAHR mentioned the effect of malaria on the H titre in inoculated persons. Dr. J. M. ALSTON wondered whether the various phage types of organism represented any differences in virulence and asked about supplies of bacteriophage.

Colonel BOYD, in reply, said that Salmonella infections were rare in the Army in India. He agreed that O agglutinins might be found after T.A.B. inoculation. So far no antigenic differences had been discovered in the various phage types of organisms. The bacteriophage was readily propagated and could be preserved for several months.

SECTION OF ORTHOPAEDICS AND FRACTURES

Friday, July 28

Closed Fractures of Radius and Ulna

With Mr. ANDREW FOWLER Vice-President of the Section, in the chair, Mr. ST. J. D. BUXTON traced the progress of 400 fractures treated in one hospital, discussing the types of fractures under the following five headings: (1) greenstick with no angulation treated by fixation in plaster; (2) greenstick with angulation treated by reduction under anaesthesia and fixation in plaster; (3) fractures other than greenstick requiring no reduction and treated by fixation in plaster; (4) fractures other than greenstick treated by closed reduction and fixation in plaster; (5) fractures treated by open operation. He said that all *x*-ray photographs of forearm fractures should include the elbow- and wrist-joints. Good results were more rapidly gained by extending the plaster from the lower axillary border to the metacarpal necks. He described his method of plastering with additional anterior padding. The group comprising fractures other than greenstick which required treatment by closed reduction and fixation in plaster presented the most difficult problem in fracture surgery. If manipulation failed operation should be decided on quickly. In 60 per cent. of his cases the operation was an open reduction without internal fixation. Mr. Buxton stressed the recognition of and treatment of dislocation or subluxation of the superior or inferior radio-ulnar joint with fracture of a single forearm bone. Complications were rare, although ten children were seen with recurrent fractures within a year. The points to be observed in treatment were the correction and replacement of the bone fragments, the fixation in plaster for a sufficient length of time, the maintenance of correct alignment of the superior and inferior radio-ulnar joints, and the moving of the finger- and the shoulder-joints from the beginning of treatment.

Mr. A. O. PARKER (Cardiff) said that in the treatment of comminuted fractures of the forearm the usual procedures of hand traction on the forearm were unsatisfactory, and he had adopted the method of axis traction. At the suggestion of Mr. Naughton Dunn he had improved his earlier technique by using a swivel in the line of traction; this allowed the forearm to rotate while it was being pulled and utilized the pressure of the groups of forearm muscles in moulding the fragments into proper alignment. The method was simple to apply and, he was confident, gave the best results. The average time over which traction was maintained was seventeen days. The extension was then removed, non-padded plaster was applied, and active use of the hand- and elbow-joints was encouraged.

Dr. P. D. WILSON (New York) was afraid of traction and usually preferred to operate. He agreed that in most cases open reduction was all that was necessary. With his method he operated with the patient in the prone position and the arm stretched on an arm-board; he then fixed the arm in plaster with the elbow in extension. Mr. NAUGHTON DUNN (Birmingham), demonstrating the swivel method of reducing fractures of the forearm, explained how the pressure of the groups of muscles was utilized in moulding the fragments into proper alignment. Mr. W. C. GISSANE said that Böhler never used Kirschner-wire traction to obtain reduction, but to maintain position after reduction. Mr. ALEXANDER MITCHELL (Aberdeen) had obtained satisfactory results by using catgut to fix his fragments in position. Mr. H. O. CLARKE (Manchester) emphasized that, while all fracture-dislocations of the upper end of the ulna and radius, if treated early, could be reduced by manipulation, fractures of the lower third of the forearm needed internal fixation to preserve alignment.

Mr. BUXTON, replying, stressed the importance of longer immobilization after operative treatment than after closed reduction.

In answer to a question Mr. PARKER stated that stiff fingers had never resulted from his method of glove traction, as the pull was obtained from the hand proximal to the fingers.

Spasmodic Flat-foot

With the President of the Section, Mr. ALEXANDER MITCHELL, in the chair, Mr. ALAN H. TODD, in a discussion on the aetiology and treatment of spasmodic flat-foot, said that, although spasmodic flat-foot was a clinically well-defined condition, its pathology was still obscure and its treatment almost empirical. For treatment to be improved the cause of the condition must first be elucidated. Distinction must be made from the rigid flat-foot due to organic fixity. About eight cases (5.7 per cent.) occurred among 141 patients with flat-foot; these were observed in 1,000 consecutive orthopaedic out-patients. The sexes were equally affected, the average age of the males being 18 and the females 15¼. About one-third gave a history of some recent injury to the ankle or foot, and in most of the others there was a history of standing for long periods at work. In some instances the condition was bilateral, but in the majority it was unilateral. In very few cases was there any hisory of recent infection, such as tonsillitis. The condition was usually assumed to be due to reflex spasm of the evertor muscles, induced by a painful state of the medial part of the foot. In some cases there was an obvious cause of spasm; in others prolonged foot-strain seemed to be an important factor. Under similar conditions some people were affected and others were not. Mr. Todd considered that inherent structural weakness of the foot was a more probable explanation than the more popular theory of latent infection. The cause of the spasm, not the spasm itself, should be treated. Tenotomy and excision of the peroneal tendons were based on an aetiological misconception, so was manipulation. Complete rest was the mainstay; many patients improved greatly after a month in bed without any other treatment. The foot should not be strained into a position of exaggerated adduction-inversion, nor should the patient be made to walk thus. Better results were obtained by immobilizing the foot in a position of relaxation, the physiological position of rest. To prevent relapse the use of a support was advisable for a year or more.

Mr. A. M. HENDRY (Birmingham) showed how peroneal spasm was first an exaggeration of normal postural reflex and later a protective one against the distortion of the bones and joints on the outer side of the foot. In treatment it was essential to relax the spasm, to correct the deformity, and to prevent recurrence. He disagreed with Mr. Todd's methods of achieving these results and advocated the novocainization of the external popliteal nerve to secure relaxation, the fixing in plaster in a position of adduction and full pronation for a

minimum of four weeks, and the wearing of some form of support for a considerable period afterwards.

Mr. BUXTON regarded spasmodic flat-foot as traumatic arthritis of the mid-tarsal joints and treated it accordingly. He had never seen a case of bilateral spasmodic flat-foot. Mr. NAUGHTON DUNN said that in old cases there was true shortening of the tendo Achillis and peroneal tendons, requiring tenotomy. The fore-part of the foot should be pronated to prevent relapse.

Mr. TODD, in reply, said that he had no objection to plastering. He wanted to rest the affected foot, and fixation in plaster was, after all, the optimum method of enforcing rest. He asked his critics to try both methods and to come to their own conclusions.

Mr. P. B. ROTH (Stoke-on-Trent) showed a film illustrating the treatment of a crushed spine. Hyperextension was obtained by means of a sling on a frame, the patient being prone. Plaster was then applied over the sling and the patient allowed to walk with crutches in ten days.

SECTION OF OPHTHALMOLOGY

Friday, July 28

Convergence Deficiency

With the President of the Section, Dr. W. CLARK SOUTER, in the chair, Miss IDA MANN opened a discussion on clinical aspects of convergence deficiency. She drew special attention to those cases that showed 6 degrees or more of exophoria on the Maddox wing test, but with the Maddox rod might show no abnormality. The incidence of the condition had been estimated at about 2 per cent.; in her own series of 6,400 patients it was 2.6 per cent. The symptoms were ill-defined "eye strain" unrelieved by glasses and inability to persist with close work. Age and sex did not appear to be significant factors. Objective findings and symptoms did not always correspond; physical signs without symptoms might be present, and improvement in the objective condition was not always followed by relief of symptoms. The psychological factor was therefore considerable. Physiologically it would appear that even the simplest efferent impulse involved a generalized activity of the whole cortex. Nevertheless two areas stood out in the mechanism of ocular movements: the frontal area governed voluntary movement, and the occipital area was concerned with the fixation reflex. In effective convergence the two mechanisms were co-ordinated. In convergence deficiency it was likely that the phylogenetically younger frontal mechanism was at fault. Children appeared to have developed full co-ordination by the age of 6 years. Treatment consisted in strengthening either the involuntary occipital part of the mechanism or of the conscious frontal component. In practice both methods were combined—graduated exercises in fusion for the one and giving the patient some understanding of the nature of the voluntary mechanism for the other. In a series of eighty-two cases seventy-one were treated by orthoptic exercises; forty were cured, and of the remainder all but four improved.

Mr. O. GAYER MORGAN drew attention to Stutterheim's monograph on the subject, and held that that author tended to underestimate the cerebral component. Treatment was satisfactory and consisted of making the patient understand the nature of physiological diplopia, overcoming the almost constant suppression present, improving the convergence power on the synoptophore, and encouraging the use of the diploscope.

Traumatic Myopia

Mr. GAYER MORGAN, in a paper on this subject, distinguished four types according to the intensity of injury: (1) That due to spasm of the ciliary muscle associated with spasm of the sphincter pupillae or with traumatic mydriasis. The condition was transient, though it sometimes persisted for months. (2) That due to partial rupture of the suspensory ligament of the lens associated with iridodonesis. This type of myopia was frequently permanent. (3) That due to changes in the lens. Here the degree of myopia and the course were variable. (4) That due to damage of the cornea or sclerotic producing some axial elongation on healing.

Chemotherapy in Ophthalmology

Mr. FREDERICK RIDLEY stressed that the normal anti-bacterial action of the lysozyme in the tears tended to be destroyed by many of the usual conjunctival antiseptics, such as halogen derivatives and the heavy metal salts, though argyrol and protargol were harmless to lysozyme and effectively bacteriostatic in suitable concentrations. Drugs of the sulphonamide group had no advantage in local use, for on the oral administration the concentration in the ocular fluids was the same as that in other body fluids and therapeutically adequate. Of local applications, silver nitrate and atropine were effective because they increased the lysozyme content of the tears. Zinc probably acted on the toxin rather than on the Morax-Axenfeld organism, and mercurochrome and acriflavine, because of their inhibitory effect on lysozyme, were to be employed for short periods only. Mr. Ridley subscribed to Fleming's insistence on using sulphonamide drugs as measures for reinforcing the normal defences of the body rather than as an exclusive treatment. Already the classical description of gonococcal ophthalmia had become obsolete owing to the use of sulphapyridine, and good results in pneumococcal infections and trachoma were being reported.

Mr. J. COLE MARSHALL gave a film demonstration of operations for detached retina. He pointed out that surface coagulation has the disadvantage of its effect being influenced by such factors as the pressure exerted on the electrode, the thickness of the sclera, and the dryness of the surface. There was, therefore, a danger of over-dosage. Perforating diathermy had advantages, particularly if 0.5 mm. and 1 mm. needles are used, for with such needles there is very little loss of fluid. The length and thickness of the needle used varies with the point to be perforated; thus where the sclera is thin, as under the muscle insertions, a very fine needle is to be used. The needles have to be pressed well into the sclera before the current is turned on, and then under current the point is driven home. Mr. Marshall advocated the use of a series of catholysis punctures outside the diathermy coagulation area to get better adhesion. The current must be on before the catholysis needle is put in, as otherwise a new hole might be made. When catholysis is used for localizing a hole it had to be remembered that the position of the gas bubble was sometimes misleading. He thought that the transillumination method used at Utrecht for localizing holes was the best, though it required specialized assistance.

This paper was discussed by Dr. Beatrix B. Law (Aberdeen), and the meeting concluded with further film demonstrations of some standard eye operations.

SECTION OF RADIOLOGY

Friday, July 28

Thorotrast in Diagnosis of Cerebral Lesions

With Dr. RUSSELL J. REYNOLDS in the chair, Mr. ROBERT MCWHIRTER (Edinburgh), opening a discussion on the use of thorotrast in the diagnosis of cerebral lesions, said that it was of value in the diagnosis of the following intracranial abnormalities: (1) aneurysms of the internal carotid artery or its branches; (2) arteriovenous fistulae; (3) superficial cerebral tumours; (4) cystic tumours; (5) tumours displacing the ventricles. Aneurysms of the internal carotid artery or its branches were congenital in origin, not uncommon, and usually situated near the termination of the internal carotid or the beginning of its larger branches. Their diagnosis was important from the point of view both of prognosis and of treatment, for they might rupture suddenly and cause death.

Injection of thorotrast into the carotoid artery could definitely establish the diagnosis and determine the site affected and the exact position of the aneurysm. Arteriovenous fistulae were probably due to angiomata which had acquired a vascular connexion. They increased in size as a result of this, and might give rise to epileptiform fits. The continuous noise which rose and fell with the pulse was often very distressing to the patient. The fistulae were usually situated on the surface of the cerebral hemispheres. Injection of thorotrast showed the abnormal vascular distribution, and frequently also the enlarged veins draining the lesion. Tumours at or near the surface of the cerebral hemispheres displaced branches of the internal carotid, and this change could be seen in the film when the vessels were outlined by thorotrast. Many cerebral tumours were cystic, and by injecting the cyst with thorotrast its exact position and extent could be seen. Such information might, the speaker said, determine the best method of approach to the tumour and give information regarding its possible nature; for the more benign lesions had smooth walls, and the more malignant ones and the metastatic tumours irregular shaggy walls. In the case of tumours displacing the ventricles air usually gave all the information desired, but in some instances additional information was obtained by injection of thorotrast into the ventricles. This was particularly true in tumours in the region of the third ventricle. A small amount of thorotrast was injected and a few days allowed for precipitation on the walls of the ventricles. Tumours growing into the roof of the third ventricle or projecting upwards into the floor might then be clearly demonstrated.

Referring to the dangers of the use of thorotrast, Mr. McWhirter said that thorium dioxide was radioactive and became deposited in the reticulo-endothelial system. In animals injection of large quantities had been shown to be dangerous. In his group of cases the amount of thorotrast was small in comparison with body weight. About 10 c.cm. sufficed for the demonstration of vascular abnormalities. When injected into cystic tumours the thorotrast remained there and did not appear to be absorbed, and so could not damage the reticulo-endothelial system. When injected into the ventricles it could in the main be removed at the time of operation by washing out the ventricles with saline. The risk was therefore probably very slight, and the information obtained more than justified any possible danger, as the lesions themselves were all of a serious nature.

Mr. McWhirter showed many beautiful radiographs to illustrate his paper, and in conclusion acknowledged his indebtedness to Mr. Norman Dott and other colleagues for their collaboration.

Dr. S. COCHRANE SHANKS expressed surprise at the high position of the straight sinus, as demonstrated by the angiograms shown by the opener. He agreed with him on the great value of thorotrast in differentiating between simple and malignant cerebral cysts, but was anxious about its use in ventriculography. He asked if there was any prospect of obtaining a less irritating medium—perhaps of the halogen type.

Dr. DOROTHY S. RUSSELL, referring to the dangers of late damage from thorotrast, said she had found that in some cases of cerebral tumour the injection of thorotrast had caused capillary occlusion, with rapid exacerbation of symptoms. She also stressed the danger of obstruction of the cerebrospinal fluid pathways from intraventricular injection of thorotrast. In animal experiments she found such injection to produce obstructive ependymitis and inflammation of the choroid plexuses, while any which reached the pia arachnoid gave rise to a late leptomeningitis.

Dr. A. E. BARCLAY (Oxford) quoted his experience of the intra-arterial injection of different contrast media in foetal lambs. Injection of thorotrast or 35 per cent. perabrodil led to no immediate after-effect, while injection of uroselectan B was followed by some shock.

Dr. RUSSELL J. REYNOLDS spoke of the necessity, in cerebral angiography, for timing the exposure accurately after the injection. He mentioned the difficulty there might be in differentiating between aneurysm of the internal carotid artery and other tumours in that region, and agreed on the value of intracystic injection of thorotrast in determining their malignancy.

Mr. MCWHIRTER, in reply, said that uroselectan B and perabrodil did not give dense enough shadows in cerebral angiography, while if injected into cysts they might not be deposited on the wall of the cyst. He was fully aware of the risks of intraventricular injection of thorotrast. The method was very rarely used at his clinic—only as a last resource in seemingly hopeless cases in which air injection failed to clear up the diagnosis. The amount of thorotrast injected was small, and at operation as much as possible was washed out through a cannula, to avoid soiling the meninges. He had not met any cases of capillary vascular occlusion following the injection of thorotrast. With regard to other contrast media, diffuse ependymitis resulted from the use of lipiodol in ventriculography from gradual liberation of free iodine; an attempt was being made to obtain a stable contrast medium to avoid this complication.

REHABILITATION AFTER ACCIDENTS

FINAL REPORT OF INTERDEPARTMENTAL COMMITTEE

The final report of the Interdepartmental Committee on the Rehabilitation of Persons Injured by Accidents was published on Friday last.[1] The committee was set up in April, 1936, by the Home Secretary, the Minister of Health, and the Secretary of State for Scotland to inquire into the arrangements made in this country for the restoration of the working capacity of persons injured by accidents. The decision to appoint this committee was taken after consideration of the report issued by the British Medical Association early in 1935.[2] The committee's terms of reference were:

"To inquire into the arrangements at present in operation with a view to the restoration of the working capacity of persons injured by accidents, and to report as to what improvements or developments are desirable, and what steps are expedient to give effect thereto, regard being had to the recommendations made in the report issued by the British Medical Association in February, 1935, on fractures."

The medical members of the committee, of which Sir Malcolm Delevingne was chairman, were Dr. Muriel C. Bywaters, Mr. W. A. Cochrane, Dr. T. Ferguson, Mr. E. W. Hey Groves, Dr. J. F. E. Prideaux, Mr. H. S. Souttar, and Mr. A. C. T. Woodward. In May, 1937, the committee issued an interim report[3] embodying the outline of a scheme for the organization of fracture clinics. This scheme, which was discussed in the *Journal* of June 12, 1937 (p. 1218), is embodied in the present report in a more complete form but without any substantial modification. Comment on the final report will be found in this issue at p. 402. We give here a brief summary of the work and the findings of the committee.

Statistical Aspects of the Inquiry

According to returns supplied by 853 voluntary hospitals, 121 municipal hospitals, and 448 Poor Law infirmaries the total number of new fracture cases treated in 1935 was 204,738 (139,129 out-patients and 65,609 in-patients), and of these 178,945 were treated by voluntary hospitals. The total number of accident cases, including cases of fracture, was 1,303,478 (1,166,758 out-patients and 136,720 in-patients). Thus, in cases of fracture, the pro-

[1] Final Report of the Interdepartmental Committee on the Rehabilitation of Persons Injured by Accidents. 1939. H.M. Stationery Office. (3s. 6d.)

[2] *British Medical Journal Supplement*, February 16, 1935. Reprinted in pamphlet form. Price 3d., or 4d. post free, from the British Medical Association, Tavistock Square, W.C.1, or through any bookseller.

[3] Interim Report of the Interdepartmental Committee on the Rehabilitation of Persons Injured by Accidents. 1937. H.M. Stationery Office. (4d.)

portion treated as in-patients was about 32 per cent. as compared with 10 per cent. for all accidents.

Information as to the results of treatment was difficult to obtain, since only a few hospitals have any system of following up their old patients. A special inquiry in which fourteen fracture departments took part was therefore arranged, and in all 6,364 cases of fracture were carefully reviewed. Of these cases, 45 per cent. were men between 15 and 65; 23.5 per cent. were women between 15 and 65; 25.7 per cent. were children under 15; and about 6 per cent. were over 65. The figures show clearly the need for special provision to restore working capacity. The ratio of uncomplicated to complicated cases was almost exactly 10 to 1, and in over half the complicated cases (309 out of 571) the complication arose out of the fact that the injury was a compound fracture. Out of a total of 5,791 cases of simple fracture treated to a conclusion in these well-organized clinics, 4,090 (70.6 per cent.) were written off as "function fully restored," but in 1,364 (23.5 per cent.) treatment was discontinued before function was fully restored, complete recovery being expected without further treatment. Perhaps the most striking feature of this detailed analysis, however, is the evidence it gives as to delay in seeking treatment. Even patients with fractures of the lower limb may wait for days or even weeks before seeking advice. In 5,679 cases of fractures of all types 19.2 per cent. of the patients delayed one to two days before attending for treatment, 10 per cent. waited three to seven days, and 2.6 per cent. eight to fourteen days. Analysis of a further group of 19,286 fracture cases showed that 29.2 per cent. were due to industrial accidents and 14.9 per cent. were the results of road traffic accidents. There is no means of estimating the cost to the community of this accident roll, but the cost of workmen's compensation alone averages about £11,000,000 per annum, though industrial accidents do not form more than a third of the yearly total of accidents of all kinds.

Fractures and allied injuries constitute—if both the number and the degree of disablement caused are considered—much the most important group of injuries by accident, and it is therefore this aspect of the accident problem which has received most attention from the committee. Throughout its report the committee insists that if progress is to be made the efforts of all concerned must first be concentrated on the institution of a country-wide scheme of fracture services.

Organized Fracture Services

The system, which was universal till a comparatively recent date and still prevails to a great extent in the hospitals of the country, by which fractures are treated in the general surgical wards and under the general surgical routine is gravely defective, and a radical change of method is necessary. The most authoritative surgical opinion of the country is agreed in recommending the institution of special fracture services throughout the country, and the same view is taken by the British Hospitals Association. In a number of hospitals fracture services have already been instituted, and the unanimous testimony of those who have been working them is that periods of disability are shortened and improved results are obtained. Such services should be based on three principles:

(*a*) All fractures (except head) should be segregated in a single department, which would provide for both in-patients and out-patients.

(*b*) The service should be operated and controlled by a single team under a surgeon-in-charge.

(*c*) The treatment should be continued until restoration of working capacity has been effected to the fullest possible extent.

While not dissenting from the view that a fracture service is capable of extension to include other classes of injury—for example, the numerous injuries to hands and fingers—and that such extension ultimately is desirable, the committee does insist that "proposals for the institution of 'general' traumatic services are not called for, and would under conditions in this country be impracticable." At the same time the committee recognizes that from the patient's point of view it makes no difference, as regards economic and other worries, whether he is laid off from work by a fracture or by serious burns or other injuries. It does urge, therefore, that where working capacity is in danger of being impaired, whatever the type of injury, control should be exercised and treatment continued until full restoration is effected, provision being made, where necessary, for the application of remedial exercises, etc., in such cases.

The modern fracture service should be based on certain principles of organization and treatment. The principles of organization may be summarized as concentration of cases in one department under single control, continuity of treatment and supervision by that department until restoration of working capacity has been effected to the fullest possible extent, and a system of records of cases which will permit the history of each case to be followed from start to finish, and the final results ascertained. The principles of treatment aim at securing in every case exact reduction of the fracture, fixation in correct position and immobilization of the broken part, and active movement from the earliest possible moment of the uninjured part of the limb to prevent wastage of muscles and stiffness of joints. Methods of treatment are not in question; it is the organization of the hospital services which has been, and in many cases still is, defective and in which a radical change is needed. The proved advantages of unified control are so great that the interests of individual members of the staff should give way to the general interest of the community. "We cannot assent to the proposition [put forward by a group of Glasgow surgeons] that all persons deserving of the name of surgeon should be regarded as equally competent to deal with fractures." It should perhaps be added that this Glasgow suggestion was "the only important medical evidence in criticism of the scheme [for organized fracture services] in our interim report."

The actual organization and functions of a fracture department are next considered and approximate estimates of the annual cost of a fracture department in a hospital of 500 to 1,000 beds (£1,700) and in a hospital of 200 to 500 beds (£1,050) are given. These figures include payments of an honorarium of £500 in the one case and £300 in the other to the surgeon-in-charge. It is pointed out that the standard of work of a fracture department depends primarily upon the detailed supervision and the personal direction of the treatment of cases by the surgeon-in-charge. If a high standard of efficiency is to be maintained the surgeon-in-charge will have to undertake much more onerous and time-consuming duties than those usually falling to the lot of a visiting surgeon. This being so, in the case of many hospitals "it may be difficult to secure the man best qualified for the work unless he receives some honorarium for his services."

As to accommodation, it is suggested that a general hospital in a city with a mixed population may need from fifteen to twenty beds for each thousand cases of fracture dealt with yearly. The importance of provision for the immediate treatment of shock is stressed and the "Shock Room" which is a feature of the fracture clinic at the new Albert Dock Hospital is described in some detail. Plans of two fracture out-patient departments recently erected in Liverpool are appended to the report, as is a full account of the essential features of the routine of modern fracture clinics.

Restoration of Functional Activity

After-care, following the immediate surgical treatment for securing union of the broken bone, is recognized as an integral and vitally important part of the work of the

fracture clinic, and in the opinion of the committee after-care, whatever form it takes, should be directed and supervised by the surgical team responsible for the initial treatment of the fracture. Physiotherapy may be of value in certain cases. Occupational therapy may be even more important in many cases, but the committee seems to take the view put forward by Mr. R. C. Elmslie, on behalf of the British Orthopaedic Association, that occupational therapy should be undertaken at rehabilitation centres proper rather than in hospitals. So far as hospital after-care is concerned, the committee's attention, therefore, has been directed mainly to the provision to be made for remedial exercises. Ideally the fracture department should have its own gymnasium for remedial exercises and its own physiotherapeutic department. Actually, however, the general principle that systematic and sustained exercises, of a progressive character and under proper control, are an essential part of the rehabilitation process can be applied with even limited accommodation and equipment of the simplest and most inexpensive character. With adequate facilities it should be possible to treat a large proportion of fracture cases to a conclusion, the patients being discharged ready to return immediately to their full-time jobs. Patients who return to "light work" before their treatment is concluded appreciate the convenience of evening clinics held perhaps once a week.

Psychological Difficulties

The interest and help of the general practitioner are essential to the success of any scheme for the treatment of fractures. The more efficient the fracture service the more ready he will be to refer to it his cases of fracture or suspected fracture. His co-operation is important in every case, but especially so when the patient lives at a considerable distance from the clinic or for other reasons is unable to attend regularly. As the first doctor to be called to any accident he is also in a strategic position to prevent—or set in train—psychological sequels. These sequels seem to be determined in certain cases by harmful suggestions as to the duration of incapacity and the degree of disability likely to result from an accident, and in others by inefficient or too prolonged physical treatment or unnecessary hospitalization. Most commonly, however, psychological difficulties tending to retard recovery arise from fear of the economic consequences of the accident.

Efficient treatment of the physical injury in a well-organized fracture service by ensuring a return to full functional activity in the shortest possible time should go far to prevent many of the psychological difficulties arising from fear of prolonged disablement. Further reduction of these psychological sequels would obviously be brought about by measures taken to relieve the consequential economic effects of the accident. The committee does not offer suggestions as to how this might be effected because so far as industrial cases are concerned these questions will be considered by the recently appointed Royal Commission on the Workmen's Compensation Acts. It makes one definite recommendation, however, which has a bearing on this point:

"Under the law as it stands at present an injured workman who has so far recovered as to be able to undertake 'light' work may have his compensation reduced. If, owing to the inability or unwillingness of his previous employer to find him such light work or to the state of the labour market in the place where he resides, he is unable to obtain such work, he has the choice either of applying to the Court for the restoration of his compensation to the full amount or (if he is an insured person) of applying for unemployment benefit. We are informed that unemployment benefit is frequently claimed in such cases, with the result that a man may be receiving in partial compensation and unemployment benefit together more than his full compensation rate, or, if he has a large family, even more than his wages for full-time employment. It is obvious, in such circumstances, that an injured man's 'will to recover' is liable to be weakened. We would most strongly recommend that an injured man's capacity for light work, which may be reached at a certain stage of his treatment, should be regarded, not from the point of view of compensation and as a reason for reduction of the compensation but solely as a means by which the complete restoration of his working capacity can be furthered. As long as the patient requires to be under the treatment of the fracture department he should continue to receive compensation as for total incapacity, unless light work of a remedial kind approved by the fracture department surgeon is available. In other words, 'light work' should only be admitted as part of the curative treatment."

One other question which the committee has considered is whether it is possible or desirable to make special provision for the treatment of the neuroses occurring in connexion with rather less than 1 per cent. of fracture cases and rather more than 1 per cent. of other cases of accident. Giving evidence before the committee Dr. W. A. Brend said: "Increase of the facilities for treating the neuroses is urgently required for all classes of the community, but it does not seem to me advisable that a movement in this direction should form a prominent part of an effort to help injured workmen." In view of this and of the divergent opinions of other medical witnesses the committee does not feel justified in recommending at the present time the provision of special treatment for neuroses associated with accidents. It does suggest, however, that a fracture service should have facilities for consulting a medical psychologist when the surgeon-in-charge considers this desirable.

(To be concluded)

Local News

SCOTLAND

Lunacy in Scotland

The report of the General Board of Control for Scotland for the year 1938 shows that on January 1, 1939, there were in Scotland, exclusive of insane persons maintained at home by their natural guardians, 19,670 insane persons of whom the Board had official cognizance. Of these, 2,706 were maintained from private sources, 16,873 from the rates, and ninety-one at the expense of the State. There was a decrease in the number of registered insane at January 1, 1939, of sixteen. The number of patients discharged recovered during 1938 was 919, and the number of deaths was 1,303. The report deals with the results of the shock treatment of schizophrenia by intravenous injections of insulin and by injections of cardiazol. While it is indicated that too short a time has elapsed to arrive at definite conclusions as to lasting results, the return shows that out of twenty-seven asylums eleven are making use of this form of therapy. The importance of some method of treatment for this condition is shown by the fact that in certain hospitals schizophrenia is reported to account for over 50 per cent. of the admissions. The total number of cases treated was 316, of which sixty-nine were treated by insulin alone, 241 by cardiazol alone, and six by a combination of the two methods. Patients discharged after treatment numbered 106, fifty-four with complete remission of symptoms, fourteen with only one symptom left, thirty-one with partial remission, and seven were unchanged. Among patients not discharged, seventy-nine showed amelioration of symptoms, 126 were unchanged, and five were worse. No deaths were recorded. Reference is also made in the report to the value of occupational therapy for patients who are physically fit. This includes the making of rugs and similar articles in the wards, carpentry and

joinery in special buildings, and gardening, which has proved especially suitable for women patients. The rate-aided insane cost local authorities a total of £1,066,901. The average charges for these persons were 23s. 8d. a week per head in royal asylums, 21s. in district asylums, 18s. 5d. in wards of poorhouses, and 13s. 7d. in private dwellings. The expenditure on aided mental defectives in certified institutions and under guardianship was £329,579.

Aberdeen Royal Infirmary

At a recent meeting of the directors of Aberdeen Royal Infirmary preliminary plans for the Watson-Fraser Nursing Home were submitted for consideration. This proposed new nursing home will be erected at Forresterhill, adjoining the infirmary and the new medical school. At the same meeting the directors placed on record their great regret at the resignation of Professor James R. Learmonth from the office of surgeon to the infirmary. Professor Learmonth's resignation, which takes effect from August 31, follows his appointment as Professor of Surgery in the University of Edinburgh.

ENGLAND AND WALES

New Children's Hospital for Leeds

An important addition to the health services of Leeds is contemplated in the local health committee's scheme for a new children's hospital at Moortown. This provides for a new building off King Lane and overlooking Adel Moor which will, in the first instance, accommodate 156 beds. On the ground floor in addition to four wards there will be the pathological and *x*-ray departments, and on the first floor the departments for physiotherapy and four wards. Four six-bed cubicles and accommodation for five nursing mothers will occupy the second floor; and thirty cubicles for babies and an operating theatre the top floor. An admission block containing ten cubicles will permit children to be isolated until they are known to be free from infectious diseases. The new building is estimated to cost £184,000, and it has been so designed that the accommodation can be doubled to 312 beds by an extension which will mean a minimum of disturbance to the earlier part. The plans have been approved by the Leeds Health Committee, but require the endorsement of the city council and the Ministry of Health before they are carried out.

Liverpool Health Report

The report for 1938 of the Public Health Department, City of Liverpool, states that the figures for the birth rate, death rate, infantile mortality rate, and maternal death rate are the lowest ever recorded in the city. The birth rate, 18.7 per 1,000, is nevertheless considerably higher than that for England and Wales as a whole. Mortality has declined by 59 per cent. since 1871, and some instructive tables are devoted to an analysis of this decline. Infective diseases, including all the infectious diseases with the exception of influenza, show the greatest proportional decline. Deaths from tuberculous diseases and from digestive diseases, notably infantile diarrhoea, have also markedly declined. On the other hand, the mortality from cancer is now nearly four times as high as in the seventies of last century, chiefly attributable to increasing longevity of the population and improved methods of diagnosis. Radium is available for the treatment of cancer at the Liverpool Royal Infirmary and the Liverpool Radium Institute, and lead therapy has been employed at the municipal hospitals under the guidance of Dr. Datnow, of the Liverpool Medical Research Organization. There were four cases of anthrax during the year with recovery, and the report states that since the practice of treating anthrax patients with neokharsivan intravenously in addition to large doses of serum was begun five years previously no death has occurred in a series of twenty-four cases, including several with severe and dangerously located infections. Although the diphtheria death rate has fallen steadily from the figure of 1895, when thirty-one patients out of every hundred died, to a percentage ranging between 5 and 7 during recent years, the hopes of a material reduction in incidence, following extensive hospitalization and improvements in treatment, have not been realized. On the contrary, there has been a greater number of cases, and since 1929 an epidemic has taxed the hospital accommodation severely and given rise to some anxiety. More extensive protective inoculation is advocated. During the year under review 9,666 persons received a complete course of diphtheria prophylactic, while a further 862 did not complete the course. The collaboration of private practitioners is said to have been disappointing; although twice offered free diphtheria prophylactic by the health department, they accounted for less than 1 per cent. of persons treated.

Health and Social Conditions in Birmingham

The report for 1938 of the medical officer of health, City of Birmingham, records satisfactory statistics, with the exception of the illegitimate birth rate. The increase in this category was related to an unusually high incidence among recent immigrants to the city—among girls, therefore, especially unprotected and exposed to risk—and for this reason does not necessarily imply a general lowering of standards. An analysis of mortality by age and sex, dealing with a total of 11,400 deaths, shows that nearly half of these—5,294—occurred at ages over 65 years, and may be largely regarded as the natural termination of life. Dr. Newsholme suggests that the remaining half of the deaths may be considered to be potentially avoidable and capable of marked reduction provided that conditions of life are satisfactory and that the public co-operate whole-heartedly in healthy living. There were 1,068 deaths under 1 year of age, and a further 214 between the ages of 1 and 5. Among school children of from 5 to 15 years the largest individual causes of death were diphtheria (38), accidents (33), nervous diseases (26), heart disease (22), pneumonia (20), and tuberculosis (18). Of 1,113 deaths in early adult life—25 to 45 years—tuberculosis was responsible for 296. In later adult life—45 to 65 years—883 deaths were caused by heart and circulatory diseases, 688 by cancer, 343 by respiratory diseases, and 260 by tuberculosis. The greater longevity of women is apparent from the fact that 1,541 of them died at 75 and upwards, while only 1,064 men reached this advanced age. Male deaths predominated in all other age groups except two—namely, between 1 and 2 years and between 5 and 15. During the year 10,807 new houses were erected, 3,003 by the corporation and 7,804 by private enterprise. Nevertheless the problem of overcrowding still persists. Although 1,211 cases of overcrowding, involving 9,020 persons, are known to have been relieved, 1,394 new cases were reported, affecting 8,996 persons, the result being a net increase of 183 overcrowded families. A substantial reduction, however, is expected during the present year. In all, 1,199 council houses and 1,175 other houses were found to be infested with bed-bugs; all of the former and 135 of the latter were disinfected.

According to the United States Department of Labour 776 alien physicians entered the United States for permanent residence from July 1 to December 31, 1938, and 324 from January 1 to March 31, 1939. In the 1938 group the following countries were represented: Czechoslovakia 31, France 16, Germany 520, Great Britain 7, Hungary 17, Italy 30, Switzerland 22, other European centres 51, Canada 45, Cuba 4, Asia 20, and other countries 13.

Correspondence

Industrial Dermatitis

SIR,—The issue which Dr. Guy D. Barton raises on this subject in your issue of August 5 (p. 309) is extremely important. It seems gradually becoming the custom for workmen to succeed in getting every form of skin disease labelled "dermatitis," after which their approved society refuses them sick benefit under the National Health Insurance scheme and directs them to get a certificate from a certifying surgeon to the effect that they are suffering from dermatitis caused by dust or liquids. The certifying surgeon, who only in the rarest instances has a competent knowledge of dermatology, hardly ever refuses it. Real industrial dermatitis is certainly common enough, but judging from certificates given it would appear that it may include not only eczema (from which it is indeed frequently difficult to distinguish it) but scabies, psoriasis, lichen planus, and even other more exotic conditions.

Dr. Barton suggests that the rash caused by paraffin, crude oil, and "mystic" (a preparation with which I am not familiar) can as a rule be easily diagnosed, as it occurs practically always on the hands and arms, and that it is the only type of industrial dermatitis met with in factories with the exception of chromic acid burns. If he wishes to be enlightened on the subject he should consult the late Dr. Prosser White's classical treatise on *Occupational Diseases of the Skin*. He will find plenty of other types in that great work. But as regards industrial dermatitis of the eczematous type (and it is that which gives rise to most of the disputes which occasionally have to be settled in court), while I cannot agree that it occurs on the hands and arms only, I would uphold as a general principle that it always *begins* on the parts most exposed to the action of the irritant causing it, and in the great majority of cases these are the hands and arms. On the other hand, in severe cases the rash may spread to other parts of the cutaneous surface quite remote and well protected from the direct action of the irritant. Then again the eruption may persist in these parts, as well as on the exposed parts, for an indefinite period with ups and downs, remissions, and relapses. In fact it behaves like a constitutional eczema, from which it can only be distinguished by the history of its original incidence. These are the cases which worry the insurance companies, who naturally try to prove that after many months of compensation the original disability has disappeared and that the patient is now a real eczema patient. They are not often successful in doing this, and sometimes only escape from an indefinite liability by handing out a sum of considerable size to the sufferer. I think, however, that they might save some of these heavy cases by always having the first certifying surgeon's certificate scrutinized by a competent dermatologist. If this were done cases of constitutional eczema, which now are sometimes accepted as industrial dermatitis, would be excluded from compensation. And I repeat that a very good principle upon which to decide whether a case is one of industrial dermatitis or eczema is the site upon which the first signs of trouble appeared. To justify the diagnosis of industrial dermatitis this should be on the parts most exposed to the irritant—that is, in the vast majority of cases on the hands and forearms. Whither the eruption may spread subsequently is immaterial to the diagnosis.—I am, etc.,

London, W.1, Aug. 8. H. HALDIN-DAVIS.

SIR,—As Dr. Guy D. Barton says in his letter, it can be a very difficult matter to decide whether or not a particular skin eruption is of occupational origin.

In most cases of contact dermatitis the changes in the skin are no different from those that occur in dermatitis or eczema of non-contact origin. Occasionally an exogenous eruption shows characteristic features which enable it to be recognized, such as, for example, the acneiform folliculitis, mentioned by Dr. Barton, affecting the arms, thighs, and legs from continual contact with various machine oils. Workers in chlorine may also develop a similar type of acne in which great numbers of comedones may form. The distribution is over regions which escape in common acne. Generally, however, there is no specific type of reaction corresponding to any particular irritant; the dermatitis due, for instance, to *Primula obconica* may present a similar appearance to that produced by washing soda or cement. Diagnosis must mainly depend therefore on a full consideration of the mode of development of the eruption, its distribution in relation to areas exposed to irritation, the exact nature of the work and of the possible irritants handled, together with the patient's previous skin history. Even after a most careful examination and a review of all the facts the decision may be a very difficult one to make, and sometimes a positive conclusion is impossible. Some of the problems are illustrated in the following case seen only a few days ago.

A man of 27 complained of a rash on the hands and forearms of five weeks' duration. He had worked in a provision shop for ten years, and constantly handled cooked meats of various kinds and bacon. His skin, therefore, was much in contact with salt; it was also necessary for him to wash his hands many times during the day. He had never suffered from any kind of skin trouble previously. He had felt pricking and irritation on and between the fingers for a week or so, and then the eruption had appeared, involving mainly the fingers, the backs of the hands, and the proximal portions of the palms. After a few days, as the rash was becoming worse, he ceased work. His hands then began to get better, but an eruption of a rather different kind developed on the forearms.

On examination his hands presented a typical picture of dysidrosis, the eruption consisting of small deeply set vesicles without redness on the lateral and dorsal surfaces of the fingers and the backs of the hands. It was in an involuting stage. On the forearms was an erythema-multiforme-like eruption suggestive of an autosensitization reaction. On examination of the feet a small peeling focus was found in the first interdigital cleft of the left foot which would have done quite well clinically for a fungous infection; no fungus, however, could be seen microscopically.

One had to consider, therefore, whether the eruption was (*a*) a constitutional dysidrosis, (*b*) a sensitization reaction secondary to foot ringworm (epidermophytid), or (*c*) a dysidrosiform eczema of occupational origin due to repeated contact with salt and soap and water. In view of the absence of any previous history of eczema, of the failure to find fungus, and of the potentially irritant nature of the patient's occupation, the last conclusion seemed the most likely.—I am, etc.,

London, W.1, Aug. 8. E. W. PROSSER THOMAS.

SIR,—The question asked by Dr. Guy D. Barton—"What condition would satisfy the dermatologist as being in the category of industrial dermatitis?"—is an issue of some practical importance, but one which even the expert will not find it easy to answer. In my view a simple and satisfactory formula which satisfies all the criteria never will be found, for although there is a general resemblance between all cases of so-called industrial dermatitis, even after thirty and more years of experience in out-patient clinics in which the incidence

of the condition averages about 10 per cent. of all cases treated, I should hesitate to make the diagnosis on clinical appearances only. After excluding such obvious traps as scabies and lichen planus, for which I have seen compensation paid in more than one instance for months at a time, I would, if I had any further doubts of extra-industrial causation, order the patient to strip. Such a procedure will expose the existence of varicose or mycotic dermatitis of the lower extremities, and sometimes assist the diagnosis of scabies by the discovery of acarine runs on the prepuce.

It follows that the factory surgeon must have at least an elementary acquaintance with the appearances of the more common dermatoses, and supports my contention that a simple formula or definition is not possible. After this preliminary examination I consider the history, without which, I further submit, the diagnosis of industrial dermatitis cannot be made. Two points seem to me important in that particular: (1) the duration of the disease as a whole and the occurrence of previous attacks; (2) are there other cases of dermatitis in the factory, and if so can they be persuaded to present themselves for examination? (Dr. Barton would have the great advantage of access to, and side-by-side comparison of, all suspected cases.) Next would come the localization; with very few exceptions this is always on the hands, including fingers and wrists, with a common tendency to spread to the forearms, upper arms, neck, face, and ears. I am always sceptical of the diagnosis when the upper extremities below the elbows show no evidence of involvement. Finally, with regard to the type of reaction most commonly seen, in spite of the complexities and variations of individual response and the immense number of potential irritants to which the modern factory hand is exposed, the clinical picture varies but little, and he would be bold indeed who would claim to recognize exact causes from the symptoms alone. In brief, they consist of erythematous, irritable, diffuse patches—of various sizes, round or oval in shape—and moist, dry, fissured, or scaling according to the stage in which the patient presents himself and not infrequently according to what has been applied for relief.

It is quite true, as Dr. Barton writes, that chromic acid burns are "quite typical." So are tar warts or mollusca and the ensuing epitheliomata. But in the huge majority of cases of industrial dermatitis the lesions are as above defined. The few exceptions are described in detail in Prosser White's *Dermatergoses* or in any of the larger textbooks of dermatology. If your correspondent is further interested I would recommend to him the recent comprehensive symposium on the subject in the *Journal of the American Medical Association* (October 22, 1938) by a number of recognized authorities on the diverse aspects of an increasingly important and universal problem.—I am, etc.,

London, W.1, Aug. 7. HENRY C. SEMON.

SIR,—Dr. Guy D. Barton asks some expert to state what condition would satisfy him that a case of dermatitis was an industrial one. I am not a dermatologist, but I was house-physician in the dermatological wards of the Western Infirmary, Glasgow, and have been certifying factory surgeon for the last twenty years. Certain rashes are typical of certain irritants, such as chrome, nickel, oil, hexamethylenetetramine (urotropine), etc., but the great majority of them are not typical. Each case has to be considered by itself. The history of the rash, its distribution, and the character of the work at which the patient has been employed have all to be taken into consideration.

The history of the rash is important. A man came to me some years ago with a generalized rash which he claimed was due to his work. His doctor's note certified "dermatitis." On inquiry I found that the rash appeared after an attack of influenza. I gave a certificate of "refusal to certify." A year afterwards he had another attack, and stated that the first attack had appeared when he was at work, which I saw from my notes was not true. I again gave a certificate of refusal, but on appeal my decision was upset. The physician who saw him did not know the correct history.

When we apply an irritant for therapeutic purposes, such as a fly blister on a knee, we do not expect to find a blister on the elbow. The same thing applies to irritants used in industry. The parts exposed to the irritant are those where we find the dermatitis. In oil acne we find the spots on the forearms and on the legs and thighs where oil-proof overalls are not worn. It seems to me that it is unfortunate that "dermatitis" without qualification is accepted as a diagnosis on certificates. It is synonymous with "compensation" in the lay mind.—I am, etc.,

Birmingham, Aug. 6. ROBERT ANDERSON.

Treatment of Open Fractures

SIR,—In your summary of the proceedings at the Aberdeen Meeting I am reported as saying that "antiseptics were dangerous in open wounds." Taken from its text that statement is one I would not readily make.

The primary conception of the Listerian ideal was to achieve the disinfection of wounds and their sterilization by chemical means, and Lister worked under a continuous spray of a powerful germicide to achieve his purpose. In other words, he gave his antiseptic a reasonable chance. In comparison the modern interpretation of Lister's principle in the application of antiseptics is very much like the small boy's application of soap and water to the back of his dirty neck—just a lick and a promise. Faith in antiseptics used in such a manner is indeed a dangerous treatment of open wounds. On the value of antiseptics I quoted the words of Professor Leriche from his Lister Lecture of 1939:

"In spite of the successes of many chemical substances—of bipp, of eusol, of the hypochlorites, of the various aniline dyes and essential oils—and in spite of the magnificent results of the Carrel treatment, the conclusion is inevitable that the large-scale experiment of 1914 to 1918 established the failure, relative but none the less unmistakable, of antiseptics. It showed that what determined the fate of a wound was, above all, the vital quality of the tissues exposed to infection."

It was my thesis that by an early radical débridement of all open wounds, with modern surgical technique, we can re-establish the vital quality of the tissues, and it is my experience that wounds so treated heal without infection. This, I believe, is the modern conception of the Listerian ideal. If for any reason an early surgical débridement is not possible, then we should fall back on our second line of defence against infection—namely, the use of modern antiseptics after the principle of Lister's application of antiseptics.—I am, etc.,

Richmond, Surrey, Aug. 13. WILLIAM GISSANE.

Tracheitis

SIR,—In the several letters which have appeared on the above subject in recent issues of the *Journal*, your correspondents have given a variety of details for distinguishing between this condition and coughs due to other

causes. But none of them, I think, has mentioned the one infallible test—namely, pressure by the finger on the trachea just below the level of the cricoid cartilage. A cough is always elicited in the case of tracheitis, but not in cases of cough due to other causes.—I am, etc.,

London, Aug. 12. ERIC PRITCHARD.

Foreign Bodies in the Oesophagus

SIR,—Mr. F. G. Wrigley is to be congratulated on his report of 200 consecutive cases of oesophagoscopy for suspected foreign bodies with only two deaths (*Journal*, August 12, p. 334). Such results as these can only be expected when early diagnosis is followed by prompt removal of the foreign body by a practised endoscopist using the proper instruments.

While it is quite true to say that a foreign body impacted in the oesophagus calls for urgent attention, I think it is always safer to wait for the services of a trained endoscopist rather than, on the grounds of urgency, submit a patient to the dangers of unskilled instrumentation in such a vital region as the oesophagus.

Every patient who is suspected of having a foreign body impacted in the oesophagus should be submitted to an *x*-ray examination before oesophagoscopy is carried out. This examination should include at least two views, one in the antero-posterior and the other in the lateral plane. Radiopaque bodies such as coins, safety-pins, and other metallic objects are easily seen, but many of the bones that become lodged in the upper part of the oesophagus are radioparent or are so radiotranslucent that they cannot be recognized in an *x*-ray film. This applies especially to the cartilaginous bones of fish, some of the larger of which (such as skate, haddock, or cod) may prove to be very dangerous. While positive *x*-ray findings are of value insomuch as they confirm the presence of a foreign body and show where and how it lies in the food passages, a negative *x*-ray report, however emphatic it may be, does not deny the presence of a foreign body. In fact, I would go further and say that a negative *x*-ray report should be disregarded if the clinical picture suggests a foreign body.

Mr. Wrigley mentions the use of bismuth or other contrast media as an aid to the radiological diagnosis of radioparent foreign bodies. That they may be of help is not questioned, but I have found to my cost that they can act as a hindrance to the extraction of a foreign body; so much so that I have made it a rule in the endoscopic clinic of which I have charge that contrast media shall only be given with the consent of the endoscopic surgeon. For my own part I prefer to rely on the clinical features as an indication for oesophagoscopy in cases of radioparent foreign bodies rather than resort to the use of contrast media in an attempt to outline the foreign body.

In this way one may be able to avoid the state of affairs that I have not infrequently been asked to remedy—namely, the removal of a foreign body that has been impacted for some days in the oesophagus, the reason for the delay being that a negative *x*-ray report has lulled the observers into a false sense of security which has only been dispelled by the increasing urgency of the physical signs.—I am, etc.,

London, W.1, Aug. 14. TERENCE CAWTHORNE.

Group Tests in Blood Transfusion

SIR,—In your issue of August 5 (p. 309) you publish a letter from Dr. A. Hayes Smith relating to grouping the blood of the population generally. His suggestion has many advantages. Not only would such a procedure often render a suitable transfusion possible in the absence of Group 4 (Landsteiner 0) donors in an emergency but it would also provide a whole range of people who would be willing to give blood in an emergency, and who are already typed. Many persons would willingly give blood if a severe case lay on the ground in front of them, even though they would not be bothered to have a grouping test done by the Red Cross or other organizations during peace time. The procedure which would appear to be necessary is that first of all official advice from some authoritative quarter should be given to the public to have the grouping test performed, in its own interest. Then as regards the marking of the person by means of tattooing in some selected spot on the body, if this were done it would appear desirable that the grouping should be confirmed by at least two observers before an indelible mark is placed on the body of the volunteer. Mistakes in grouping are not unknown. I have always felt that the Moss classification was better and easier for the lay mind to remember, and regard the adoption of the Landsteiner classification as a mistake after the more simple description of donors has been in use for so many years. An extension of Dr. Hayes Smith's idea might well be the marking of seriously serum-sensitive subjects with an "S.S." sign and diabetics with a "D." There is no danger of a grand disfigurement of the body by the adoption of these suggestions, as very few people would require a second marking. On the other hand, there are persons like myself to whom a single injection of anti-tetanic serum would be as lethal as any poison gas, and I know of quite a few others in this plight.—I am, etc.,

London, S.E.5, Aug. 8. GUY BOUSFIELD.

Price of Sulphonamides

SIR,—There appears to be endless confusion over the price of sulphapyridine (M & B 693) and its availability to National Health Insurance patients in the minds of the Minister of Health, Dr. Summerskill, and those who have read the emasculated reports in the daily Press. It does not seem to be realized that while there is no question as to its availability to panel patients who are dispensed for by the chemist, those whose medicine is supplied by the doctor are entirely reliant on the generosity of the doctor. Although the Minister of Health so glibly states that the correct price is not 7s. 6d. for twenty-five tablets, but is 4d. per dose (that is, per tablet), he omits to state that the correct use of the drug consists in the administration of twenty-four tablets in forty-eight hours.

Dr. F. Ray Bettley in his letter (*Journal*, August 5, p. 306) supports Dr. Summerskill in a statement which amazes me. He thinks a drug firm's profit should be so limited as to exclude the cost of research, thus overlooking the fact that if Messrs. May and Baker had not done their research we should not now have such a thing as sulphapyridine. It seems to me only fair that a firm should be allowed to recompense themselves for their initial outlay, and, incidentally, for the vast amount of research which is fruitless. It would surely be better if the profession were to maintain a sense of proportion in these matters, and not to use such points as "planks" in an election platform. I do not remember any such outbursts of philanthropy some years back at the sudden soar in the price of liver when its anti-anaemic factors were discovered, or at the high prices of liver extracts. To quote a similar instance, surely the Wellcome Foundation justifies the present methods.—I am, etc.,

Surrey, Aug. 5. HUGH L. W. SIXSMITH.

Slowing of Pulse in Acute Appendicitis

SIR,—I have read with interest Dr. R. S. Woodsworth's report of a case illustrating this sign in the *Journal* of July 29 (page 225). It is undoubtedly rare and may be misleading. I have recently had a similar case of my own in which the condition of the appendix resembled closely that in Dr. Woodsworth's patient, and I venture to suggest that the sign may be found in acute obstructive appendicitis of rapid onset and progress.

The patient, a man aged 30, was admitted to the Hampstead General Hospital on the recommendation of Dr. Lionel J. Stoll. Epigastric pain followed by vomiting began about 10 p.m. the previous evening. A similar attack had occurred six months ago. In the morning there was tenderness in the right iliac fossa with vomiting. Dr. Stoll stated in his letter that "he is rather shocked, with a poor pulse and subnormal temperature." On admission at 2 p.m. the temperature was 98° F., pulse rate 60, and respiration rate 20. The patient appeared shocked and complained of severe abdominal pain. There was increased resistance and tenderness in the right iliac fossa. Operation was temporarily postponed. An hourly pulse chart showed a slow increase in rate: at 3 p.m. it was 66, a 4 p.m. 70, and at 5 p.m. 84 (temperature 99° F.). Operation was performed at 6 p.m. As in Dr. Woodsworth's case, the appendix was swollen to the size of the little finger, very tense and rigid in its distal three-quarters. On section there was a fibrous stricture of the wall, distal to which the lumen contained bloodstained pus, and the mucosa was gangrenous. Proximal to the stricture, the mucosa was normal in appearance.

After operation the pulse rose to 92 at 7 p.m. and to 98 at 8 p.m., the highest rate to which it attained. It remained at this level until 1 a.m. the following morning. At 2 a.m. it was 70, at 4 a.m. 82, and at 8 a.m. 72. For the rest of the day the rate never rose above 80, and throughout convalescence never above 90.

—I am, etc.,

London, W.1, Aug. 5. CAMERON MACLEOD.

SIR,—The case reported by Dr. R. S. Woodsworth in the *Journal* of July 29 (p. 225) reminds me of the following case:

An able seaman, aged 20, reported on May 12, complaining that his bowels had not been open for three days. He had been "sea-sick" two days earlier. His temperature was 97° F., his pulse rate 70. He was given ol. ricini. Next morning he complained of a "brick" in the lower abdomen. The bowels had been well opened; his temperature was 99° F., his pulse rate 78. There was tenderness in the right iliac fossa, with muscular guarding; no further vomiting. An enema at 10.30 produced a good result, but did not alter the pain. Half-hourly temperature and pulse recordings were as follows:

09.00,	temperature	99°	pulse rate	78	11.30,	temperature 99°	pulse rate 67
19.30,	,,	99°	,,	82	12.00,	,, 100.2°	,, 76
10.00,	,,	99°	,,	67	12.30,	,, 100°	,, 68
1.00,	,,	99°	,,	67	13.00,	,, 101°	,, 68
					13.30,	,, 101.4°	,, 70

Operation was performed by Surgeon-Captain J. A. Maxwell. A mass enclosing pus was found in the appendicular region. A drain was inserted and the wound closed. Two days afterwards pus was coming away freely. Convalescence proceeded along normal lines. Two hours after operation his pulse rate was 80; five hours after, when his temperature was 103.6° F., the pulse rate was 84. The pulse rate never rose above 94, and was in the "eighties" the next day. The day after that it was between 76 and 84.

—I am, etc.,

F. W. A. FOSBERY,
Surgeon Lieutenant-Commander R.N.

H.M.S. *Glasgow*, Aug. 4.

Fluids from Rheumatic Fever Cases

SIR,—In the leading article concerning the aetiology of rheumatic fever (*Journal*, August 12, p. 342) you make the comment that pericardial and pleural fluids from rheumatic fever "will evidently be among the most sought after of all pathological materials for some time to come." May my colleagues and myself stake a claim to some of this material, and suggest that clinicians with cases of rheumatic pleural or pericardial effusion under their care should communicate with me at the Department of Medicine, Cambridge, as soon as a diagnosis of effusion is made? I will then instruct them how, when, and where the fluids should be collected and dispatched. Fluids obtained at post mortem should be treated immediately with 3.8 per cent. citrate and as much as possible—not merely a sample—sent by post direct to this address.

I am also anxious to obtain serum from rheumatic subjects during the second and third weeks after scarlet fever. Samples should be marked with the number of days from the onset of scarlet fever.—I am, etc.,

Department of Medicine, University of Cambridge, Aug. 14. W. H. BRADLEY.

Percaine in India

SIR,—In discussing L. H. Maxson's *Spinal Anaesthesia* (April 22, p. 828) the reviewer remarks that it has not been the general experience of anaesthetists in Britain that one may have to wait fifteen to thirty minutes before percaine anaesthesia is established. My experience of percaine in Britain would permit me to agree with this remark, but since coming to India I have definitely found that percaine is slower-acting here, so much so that in this hospital we have been forced to adopt a routine in which the anaesthetic is administered thirty minutes before the beginning of the operation. Captain V. R. Damle, I.M.S., F.R.C.S.Ed., surgical specialist, Razmak, fully agrees with my findings.—I am, etc.,

W. LAURIE,
Captain, I.M.S.

Indian Military Hospital, Razmak, July 19.

Alkali Poisoning

SIR,—Sufficient emphasis (if any) does not appear to be laid by hospitals upon the dangers of the excessive taking of alkalis when these are issued to patients for the home treatment of gastric and duodenal conditions.

About a year ago in London I was called urgently to see a man who had recently come under my care. He had suffered from attacks of haematemesis: but he assured me that *x* rays had revealed nothing abnormal. He was semi-comatose on my arrival, and, as it had appeared to me from his history (chronic alcoholism) and his symptoms that his haematemeses were probably due to cirrhosis of the liver, I decided that his coma was probably attributable to the same cause. A large tin of alkaline powder was noticeable at the bedside, and he was in the habit of taking a dose of this regularly, and had done so for many months. He was at once sent to hospital, where he remained for several weeks, his condition being described there as that of alkalosis.

The obvious query is why alkalis should have been given in this case when there was no very apparent conditions calling for alkalis. In any case the dangers of prolonged medication should have been pointed out.

Two or three weeks ago I was asked to see a middle-aged woman here who was suffering from symptomless vomiting. She looked well and had no pain, yet she had complete

anorexia, and vomiting persisted, even water being immediately returned. Her urine was normal. By her bedside was to be observed a large tin of alkaline powder, as in the first case described. This had been issued by the local hospital and replenished monthly for the treatment of a duodenal ulcer from which she had once suffered and which was now to all intents and purposes cured. The monthly issue of alkali, however, went on without any word of warning. She was advised to leave off her alkali immediately, and complete relief of her symptoms followed in a few days. Her appetite returned, and she retained anything she chose to eat or drink.

—I am, etc.,

G. LLEWELLYN DAVIES, M.R.C.S., L.R.C.P.

Hove, Aug. 5.

Sea-sickness

SIR,—In Colonel R. J. Blackham's summary of the present knowledge of sea-sickness, which appeared in the *Journal* of July 22 (p. 163), I noticed two omissions which I feel deserve a mention. First the suppository as a means of ensuring retention of a drug when the patient is vomiting. I find this most useful, and always give hyoscine or hyoscyamine in this way. Secondly, I feel that a hypodermic injection of morphine (1/4 to 1/2 grain) has a definite place in the treatment of sea-sickness. Consider a bad case, one that has been vomiting for two to three days, resistant to all treatment. Why withhold the only remedy that will give the sufferer relief. At the worst, it is the lesser of two evils. If one knows that the ship will soon be in calm water, and that the drug will therefore not have to be repeated, so much the better. If the patient is hyperpietic or has pulmonary tuberculosis there is all the more reason for arresting the vomiting quickly; and an injection of morphine is the one certain way of doing so. I should be interested to know Colonel Blackham's own views on morphine in sea-sickness.—I am, etc.,

C. P. MILLER,

Southampton, August 10. Surgeon, *Empress of Australia*.

Common Types of Supersensitiveness

SIR,—Drs. J. Gibson Graham and J. D. Olav Kerr in your issue of August 12 (p. 327) state that "desensitization may be specific or non-specific, but only the former method has been employed in this series," and that the desensitizing solutions for injection were prepared by Messrs. C. L. Bencard. May I be permitted to remark that Messrs. Bencard's solution contains peptone.—I am, etc.,

London, W.1, Aug. 12. A. G. AULD.

Thames Ambulance Service in War Time

SIR,—May I draw the attention of medical practitioners to a war-time service which, though unconnected with the activities of any particular borough, yet forms an important part in the civil defence of London. I allude to the Thames Ambulance Service of the Port of London Authority. This service involves the use of fourteen pleasure steamers, each capable of carrying 120 casualties and each staffed by a medical officer, three trained nurses, and ten nursing auxiliaries. The ships will work between Teddington and Hole Haven, removing casualties from riverside areas and landing them at specified landing-stages where road ambulances will meet them. Owing to the comparative immunity of the river from the effects of fires, falling buildings, etc., it is thought that the service will form an important avenue for the evacuation of casualties, who will receive treatment while they are being transported from the site of a raid. The service is now in an advanced state of organization and is about to hold its fifth exercise on the river. Of the twenty-eight medical officers required, twenty-three have already signed on and five only are still required to bring the complement up to full strength. Those interested should communicate with the Central Emergency Committee or write to, or call on, the Air Raids Precautions Officer, Port of London Authority, Trinity Square, E.C.3, for further details.—I am, etc.,

London, S.W.1, Aug. 11. J. N. LORING.

"Medical Testament" on Nutrition

SIR,—Dr. N. I. Spriggs (August 5, page 311) asks what evidence there is that crops grown with "artificials" are inferior in nourishing qualities to those grown with "more natural manures," and mentions researches which failed to detect any difference. The point is vital: the return of organic wastes to the soil seems, to those who take the position of the "Testament," the linchpin of the wheel of life. But let us be clear upon what the point is. Does "nourishing" mean complete with vitamins? Yes, Dr. Spriggs means that. Upon that point McCarrison has published direct researches (listed in his bibliography on pages 4–9 of References to the "Testament"). Does it include quality, which confers protection from disease? Does it include the stamina, which renders the plant itself immune from plant pests? Dr. Spriggs demurs to any alleged quality which is not amenable to some kind of measurement. Yet, as Sir Albert Howard has pointed out, such qualities exist: they can be sold and bought. How would Dr. Spriggs measure the quality of tobacco? (For Sir Albert's fascinating theory of the means by which quality is conveyed from soil to plant, see References to "Testament," pages 23–27.)

There is, in fact, a tremendous weight of prima facie evidence for the position of the "Testament"—that foods grown with organic manure, and partly animal at that, have quality of a different order from the products of "artificials." Pages 21 to 28 of the References give some examples. *Farmers of Forty Centuries*, by the late Professor King, is a treasure-house of such examples. Viscount Lymington's observation, that straw grown with farmyard manure and used as thatch lasts ten years as against five years in the case of straw grown with "artificials," suggests to my mind, with convincing effect, the influence manuring has upon quality. This from a letter from Captain Wilson of the Iceni farm and market garden at Surfleet is also suggestive, especially as he used to spend many hundreds of pounds yearly on "artificials" and further money on chemical sprays, and has given up both:

> "We are . . . growing all our produce on a system based on the Indore system of compost making, coupled with preparations based on Rudolf Steiner's work, and I am more than ever convinced that the vegetables which we are producing are entirely different from the ordinary commercially produced article. . . . We have certainly far greater resistance to disease and we are producing crops which I would not have believed possible three or four years ago without the aid of artificials."

But, Sir, everyone immersed in this subject agrees that the time has come to prove, in this country, by a conclusive test on a large scale and long enduring enough for all to see, whether artificial manures will or will not yield crops as healthy and health-conferring as natural organic compost will. I am glad to say that such a long-term, large-scale test is in contemplation, and it is sincerely to be hoped that, before long, it will be begun under the best auspices.—I am, etc.,

Holmes Chapel, Aug. 6. LIONEL JAS. PICTON.

Brown v. White Bread

SIR,—The annotation (August 5, p. 289) on the controversy between the advocates of brown and of white bread and "the recurring victories of brown over white" heartens those of us who have been in the thick of the fight. You truly say "the idea has triumphed," and you quote a mass of new evidence that, as you say, confirms the earlier impression of the really serious inferiority of white bread as compared with wholemeal bread in every criterion of nutritive value so far adopted. Moreover, articles contributed to the lay press by medical men (whether signed by their own names or by pen-names) invariably stress the importance of wholemeal bread as the "staff of life." The propaganda in support of wholemeal has not been without effect; thousands of wholemeal loaves are eaten to-day in excess of twenty years ago; but the fact remains that we are still a white-bread-eating nation. Every baker's delivery van is loaded with white loaves with a mere sprinkling of brown loaves among them; and this, I regret to record, applies even to bakers who specialize in wholemeal bread.

Something drastic must be done. Mussolini, soon after his advent to power, decreed the baking of white loaves illegal. Our democratic system reserves such edicts for war time, but we should not wait for that. All medical men should advise their patients to eat wholemeal bread and use wholemeal flour instead of white, and should insist on being themselves supplied with wholemeal.—I am, etc.,

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Medico-Legal

THE POOLE MILK APPEAL

The typhoid epidemic which broke out in Poole in 1936 led to a claim against a large firm of milk producers by a householder and some of the members of his family who contracted typhoid. In the trial of the action[1] before Mr. Justice Lewis the company were found not to have been negligent in any way. The learned judge awarded damages, however, on the ground that the company, though innocent, had offended against the Food and Drugs (Adulteration) Act, 1928, sect. 2 (1), which provides that no person may sell to the prejudice of the purchaser any article of food or any drug which is not of the nature, substance, or quality of the article demanded. That Act does not provide that the offence shall be wilful or the result of negligence, and the learned judge held that, as the company could have been prosecuted on the facts, they would have to pay damages, which he assessed at £865. This was a novel decision and obviously opened the door to a great many claims for damages for illness arising from poisonous food or drink. It would do away with the difficulty of proving (as the customer must prove if he founds his action on the usual ground of the Sale of Goods Act, 1893, sect. 14) that he made known to the seller the particular purpose for which the goods were required so as to show that he relied on the seller's skill and judgment.

The company appealed, and the Court of Appeal decided[2] that this ground of action—breach of sect. 2 of the Food and Drugs Act—was not good in law. Lord Justice Slesser considered that the Food and Drugs Act did not give a customer any remedies other than those given him by the Sale of Goods Act, but merely imposed penalties in cases where a civil action could be brought under that Act. He did not think that Parliament intended to provide a civil remedy in the 1928 Act, which in his view merely imposed a penalty for a wrong for which a civil remedy already existed. He also said that, whatever the effect of the Act on the claim of the householder-purchaser, the Act could not protect any other member of the household. The seller may not sell certain kinds of food "to the prejudice of the purchaser," but he owes no duty to anyone but the purchaser. Lord Justice du Parcq pointed out that possibly the great majority of the breaches of contract mentioned in the Food and Drugs Act do not result in the sale of anything injurious, but merely of something different from that which the purchaser demanded—for example, coffee with chicory instead of pure coffee, or whisky diluted with more water than the Act permits. He could not read into the Act an intention to give new rights to customers who are not parties to the contract. He also remarked that this section was not new in 1928, but was first enacted in 1875. If the interpretation of Mr. Justice Lewis was right, the provision then effected a revolution in one branch of the law, but the revolution had escaped everybody's notice until the present case.

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No. 31

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended August 5, 1939.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for : (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. Median values for the last 9 years for (a) and (b).

Figures of Births and Deaths and of Deaths recorded under each infectious disease, are for : (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases ; a blank space denotes disease not notifiable or no return available.

Disease	1939					1938 (Corresponding Week)					1930–8 (Median Value Corresponding Weeks)	
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)
Cerebrospinal fever	21	4	12		—	13	3	6	1	—		
Deaths		—	—				—	—				
Diphtheria	775	82	133	46	22	825	113	126	39	20	815	131
Deaths	14	1	5	1	2	16	—	1	2	—		
Dysentery	41	7	27		—	19	3	39		—		
Deaths				—	—				—	—		
Encephalitis lethargica, acute	—	—	4		—			—		—		
Deaths		2					—					
Enteric (typhoid and paratyphoid) fever	24	—	6	7	2	49	3	18	5	1	59	
Deaths	—	—	—	1	—	2	—	—	—	—		
Erysipelas			69	5	4			54	7	—		
Deaths		1					—					
Infective enteritis or diarrhoea under 2 years												
Deaths	21	3	16	4	3	34	9	10	4	2		
Measles		34	40		1			66		4		
Deaths	5	—	1	1	—	3	—	—	—	—		
Ophthalmia neonatorum	100	8	30		—	134	12	22		1		
Deaths												
Pneumonia, influenzal*	398	20	1	2	3	423	40	6		9	438	40
Deaths (from influenza)	6	—	—	—	—	13	4	3	—	—		
Pneumonia, primary			108	8				125	4			
Deaths		6		6	6		10		5	9		
Polio-encephalitis, acute	4	—				2	—					
Deaths		—					—					
Poliomyelitis, acute	16	6	—	2	—	61	3	9		—		
Deaths		—					—					
Puerperal fever	2	2	18	3	—	2	2	5	3	1		
Deaths		1†					1†					
Puerperal pyrexia	176	10	24		1	179	21	20		—		
Deaths												
Relapsing fever	—	—			—	—	—			—		
Deaths												
Scarlet fever	1,508	152	189	55	73	1,248	112	258	67	47	1,607	195
Deaths	2	—	—	—	—	2	1	—	1	—		
Small-pox	—	—	—		—	3	—	—		—		
Deaths	—	—		—	—	—	—		—	—		
Typhus fever	—	—	—	—	—	—	—	—	—	—		
Deaths				—	—				—	—		
Whooping-cough		192	42		—			27		17		
Deaths	6	3	2	1	—	5	—	3	—	1		
Deaths (0–1 year)	209	28	54	12	15	247	43	56	15	12		
Infant mortality rate (per 1,000 live births)	33	25				41	35					
Deaths (excluding stillbirths)	3,645	648	535	124	109	3,809	691	554	138	100		
Annual death rate (per 1,000 persons living)	8.9	8.3	10.8	8.3	9.6	9.4	8.8	11.3	9.3	8.9		
Live births	6,128	960	904	404	224	5,953	1,115	909	268	242		
Annual rate per 1,000 persons living	15.0	12.3	18.3	27.2	19.7	14.6	14.2	18.5	18.1	21.5		
Stillbirths	214	30	42			258	46					
Rate per 1,000 total births (including stillborn)	34	25				42	40					

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.
† Death from puerperal sepsis.

EPIDEMIOLOGICAL NOTES

Infectious Diseases in England and Wales during July, 1939

In the four weeks ending July 29, 1939, 7,467 cases of scarlet fever, 3,573 cases of diphtheria, 1,856 cases of primary pneumonia, and 95 cases of enteric fever were notified in England and Wales. The notifications of scarlet fever, diphtheria, primary pneumonia, and enteric fever were 112 per cent., 97 per cent., 93 per cent., and 45 per cent., of the expected numbers (deduced from the median values of the corresponding weeks of the years 1930–8). During the week notifications of diphtheria in England and Wales dropped from 833 to 775, and in London from 89 to 82, but a considerable increase was recorded in Eire and Northern Ireland. Deaths from diphtheria for the week in England and Wales have fallen from 20 to 14. In South Shields there have been no deaths for the last five weeks, although 348 persons have been affected since the beginning of this year, and there were 10 new cases last week, a number of which were carriers. Notifications of scarlet fever in England and Wales have shown a further drop since last week, in which London has shared. Decreases were also recorded in Eire and Northern Ireland and a slight increase in Scotland.

Dysentery and Poliomyelitis

The increase in the notifications of dysentery in England and Wales, referred to last week, has not been maintained, the numbers having dropped from 65 to 41 (in London from 11 to 7). The counties chiefly affected were London 7 (Bethnal Green 1, Hackney 2, Islington 2, Shoreditch 1, Wandsworth 1); Devon 4 (Dartmouth M.B. 2, Paignton 2); Essex 13 (Colchester); Kent 1 (Bromley); Lancaster 2 (Prestwich U.D. 1, Preston R.D. 1); Northumberland 4 (Newcastle C.B. 2, Wallsend M.B. 2); East Suffolk 2 (Sanford); Surrey 2 (Caterham and Warlingham 1, Farnham U.D. 1); Warwick 2 (Birmingham); Yorks West Riding 1 (Sheffield); Public Health Districts of Dartmouth and Totnes 2. The disease appears to have spread only in Colchester, where 16 cases were recorded in the previous week. In Scotland notifications rose during the week from 20 to 27; Edinburgh 14, Aberdeen 7, Clydebank 3, Glasgow 2, Dundee 1. Poliomyelitis also has fallen for the week from 23 to 16 in England and Wales and from 9 to 6 in London. Cases have been reported from London 6 (Bermondsey 2, Camberwell 3, Kensington 1); Buckingham 2 (Eton); Chester 2 (Ellesmere U.D. 1, Chester R.D. 1); Kent 3 (Faversham M.B. 2, Canterbury 1); Lancaster 1 (Warrington); Middlesex 1 (Southall); Surrey 2 (Banstead 1, Merton and Morden U.D. 1); Yorks West Riding 1 (Hoyland Nether); Carnarvon 1 (Lleyn); Glamorgan 1 (Maesteg). In four of these counties—Buckingham, Chester, Carnarvon, and Glamorgan—cases have been notified for the first time within a fortnight. The two cases at Eton were included in this week's return and were notified as polio-encephalitis; at the time of going to press a report has been received that one of the two has died.

Yellow Fever in 1939

In the *Weekly Epidemiological Record* of the League of Nations it is recorded that 33 cases of yellow fever (including 5 in Europeans) have been reported during the first seven months of the year in an area bounded by latitudes 15° North and 2° South, and longitudes 9° West and 16° East, while Senegal, French Sudan, and Dahomey, which were affected in 1938, have remained free from the disease this year. In South America sylvatic yellow fever spread eastwards from Brazil at the beginning of 1939 to the States of Minas Geraes and Espirito Santo. Between May 1 and July 31, 1 death ascribed to yellow fever was recorded in the State of Espirito Santo and 1 at Capanema, in Para State. One fatal case was also notified in Colombia, at Caracoli (Antioquia Department).

Obituary

Dr. HARRY COLE ALDERMAN of Halifax, who died in London on July 25 at the age of 65, was the son of George Cole Alderman, at one time a member of the Halifax Town Council. He was educated at the Leeds Medical School, and took the English Conjoint diplomas in 1900. After qualifying he held the post of house-surgeon at the General Infirmary at Leeds and afterwards settled in practice in Free School Lane, Halifax, becoming medical officer to the Post Office. He joined the British Medical Association in 1907.

Dr. WILLIAM METCALFE YEOMAN, who died at the end of last month aged 77, belonged to an old family of linen mill owners at Osmotherly. He studied medicine at Newcastle Medical School and in London, taking the L.S.A. and the M.B. degree of Durham University in 1886 and the M.R.C.S.Eng. in the following year. Soon after qualifying he began to practise at Spalding, and then moved to Stokesley, in West Cleveland, at that time a very difficult part of the country for a doctor to cover in the course of his rounds. Dr. Yeoman had been part-time medical officer of health, public vaccinator, and certifying factory surgeon. He retired to Harrogate in 1937.

Dr. FRANCIS GERRARD HAMILTON COOKE, who died on August 1 at the age of 64, was the son of the late Thomas Cooke, F.R.C.S., who founded and directed the once well-known private school of anatomy near Brunswick Square, London. Born in 1875, he was educated at Merchant Taylors' School and University College, London. He qualified M.R.C.S., L.R.C.P. in 1903, and in the same year received the diploma L.S.A. Nine years later he took the D.P.H. During the war he held the commission of captain R.A.M.C., and was surgical specialist to the Canterbury Military Hospital. He was also an ophthalmic specialist with the Expeditionary Force in Italy, and officer-in-charge of the nose, ear, and throat department of the Sixty-Second General Hospital, B.E.F. He had previously assisted his father in the management of Cooke's School of Anatomy from 1898–1904, and was the joint author with him of Cooke's *Tablets of Anatomy*. For many years he was acting chief medical officer of the South Indian Railway, Trichinopoly. In 1908 he published a book on the cause, treatment, and symptoms of cholera. During the latter part of his life he had lived at Westcliff-on-Sea, Essex.

We regret to record the death on August 8 of Dr. JAMES FREDERICK EDMUND BRIDGER at the age of 64. He received his medical education at St. Mary's Hospital, where he qualified M.R.C.S., L.R.C.P. in 1901 and graduated M.B., B.S.London in 1904, taking in the same year the D.P.H. The greater part of his professional career was spent in Ceylon and the British Colonies. He was for a time Port Health Officer of Barbados, and was well known subsequently as director of medical and sanitary services in Ceylon. In 1903 Dr. Bridger published a report on cases of eruptive fever in Port of Spain, Trinidad. He had been a member of the British Medical Association for twenty-six years, and was President of the Ceylon Branch from 1926–7. He had been living latterly at Slinfold, Sussex.

Dr. RICHARD ALEXANDER SMITH EDEN, who died on August 8 at the age of 78, had been a member of the British Medical Association for forty-seven years. A native of Aberdeen, he received his medical education in the university in that city, graduating M.B., C.M. in 1888. He had had some practical experience as a chemist, and also held the diploma of D.P.H. His earlier years of

medical practice were spent in Yorkshire, but in 1895 he went to Norton Canes, where he built up an extensive practice and held a post on the staff of Hammerwich Cottage Hospital. He showed great interest in all the village activities, in which for most of his life he was the only medical practitioner, and only very rarely took a holiday. When he retired in 1935 he and his wife received handsome presentations in acknowledgment of all that they had done locally. Dr. Eden is survived by three sons, one of whom is in medical practice, and by four daughters.

We regret to report the death of Dr. F. H. MCMECHAN, founder and general secretary of the International Anaesthesia Research Society, who had been actively engaged in preparing for the fifteenth annual Congress of Anaesthetists to be held in Philadelphia from October 16 to 20.

The following medical men and women have died in the U.S.A.: Dr. JAMES HENRY KENYON, New York surgeon and originator of the Hartley-Kenyon motor for brain operations, aged 67; Dr. ALFRED STENGEL, emeritus professor of medicine at the University of Pennsylvania School of Medicine, former editor of the *American Journal of the Medical Sciences*, and past-president of the American Medical Association, aged 71; Dr. ANGUS MCLEAN, Detroit surgeon and honorary member of the Royal Army Medical Corps, who commanded Base Hospital No. 17 at Dijon during the great war, aged 77; and Dr. ANNE WALTER FEARN, for forty-four years a physician in China and founder of the Fearn Sanatorium in Shanghai, at Berkeley, California, aged 71, two weeks after the publication of her autobiography—*My Days of Strength*.

Medical News

The eighteenth annual scientific and clinical session of the American Congress of Physical Therapy will be held from September 5 to 8 at the Hotel Pennsylvania, New York City. Further information can be obtained from the American Congress of Physical Therapy, 30, N. Michigan Avenue, Chicago.

The annual Congress of the Chartered Society of Massage and Medical Gymnastics is being held this year at the Caxton Hall, Westminster, from September 18 to 22. The opening lecture will be delivered by Dr. A. E. Barclay on radiographic studies of adult and foetal circulation through the heart. The Founders' Lecture will be given this year by Professor Harry Platt, the subject being "Rest and Movement in the Treatment of Fractures." Dr. G. Murray Levick will also lecture with a cinematograph on the tour of public schoolboys in Newfoundland, while Mr. John Bastow will demonstrate the use of plaster-of-Paris in the treatment of rheumatoid arthritis; this last lecture will be illustrated by lantern slides. The present position of the operative treatment of fractures will be discussed in a lantern lecture by Mr. David Trevor, and another one illustrated by lantern slides will be given by Dr. Kathleen Vaughan on exercise and posture in their relation to easy childbirth. All the meetings of this Congress are open to medical practitioners, who should apply for a full programme and ticket of admission to the secretary of the Chartered Society of Massage and Medical Gymnastics, Tavistock House (North), Tavistock Square, W.C.1.

The second International Congress of Eugenics will be held at Bucharest from September 25 to 30 under the presidency of Professor C. I. Parhon.

The sixth Congress of the Society for Criminal Anthropology will be held at Graz from September 26 to 28. Further information may be obtained from Professor Sellig, Mozartgasse, 3, Graz.

The office and library of the Royal Medico-Psychological Association (11, Chandos Street, Cavendish Square, W.) will be closed from August 21 until September 11.

The sixteenth International Congress of Medical Hydrology, Climatology, and Geology will be held in the Strasbourg Faculty of Medicine from October 8 to 13. Communications will be given on the spa treatment of the dermatoses, the indications and contraindications relating to winter sports, permeability of mineral waters, the mineral waters of petroleum localities, and the development of the French thermal industry during the last twenty years. Other kindred topics will also be discussed. Further information can be obtained from the general secretary, Professor Vaucher, the Institute of Therapeutical Hydrology, Place de l'Hôpital, 1, Strasbourg.

The 1939 Congress of the German Society for Children's Diseases will be held at Salzburg under the presidency of Professor Birk from September 11 to 14, when the following subjects will be discussed: (1) pneumonia, (2) education, physical training, and capacity of the child. Further information may be obtained from Professor Birk, Universitäts-Kinderklinik, Tubingen.

The eighth Congress of the Italian Association of Forensic Medicine and Insurance will be held at Padua from September 29 to October 1 under the presidency of Professor Rinaldi Pellegrini, director of the Institute of Forensic Medicine at the University of Padua.

The seventh International Conference on Preventive Paediatrics will be held at Lausanne on September 22 and 23, when the subjects for discussion will be the prophylaxis of physical and mental disturbance during puberty and maternal and infant welfare in country districts.

A postgraduate course on circulatory disorders will be held at Bad Nauheim from September 22 to 24. Further information can be obtained from Kurverwaltung, Bad Nauheim.

Sir Michael O'Dwyer, in a foreword to a pamphlet, *Blindness in India*, issued by the National Institute for the Blind, 224, Great Portland Street, W.1, states that the incidence throughout India is estimated at 1,500,000 totally blind and 3,000,000 partially blind. India's failure to tackle the problem is attributed partly to her oriental fatalism, partly to her caste and family systems which limit the civic sense, and partly to the fact that most of her people live in remote villages. For some years the National Institute has been helping the Indian Red Cross to run an educational campaign on the prevention of blindness, and films, posters, and other publicity channels have been used. But the immensity of the problem seems to place it beyond voluntary effort and to demand Governmental intervention. In the Punjab alone during a recent year the medical services treated 3,460,000 cases of eye disease.

By the Public Health (Smoke Abatement) Act, 1926, power is given to the Minister of Health to make Orders extending the provisions of the Alkali, etc., Works Regulation Act, 1906. In the exercise of this power Orders were issued in 1928 and 1935 extending the list of noxious or offensive gases mentioned in the Act of 1906 and extending the list of scheduled works requiring registration under the Act. A draft Order has now been prepared further extending the list of such gases and works, and a public inquiry will be held into the subject-matter of the draft at the Ministry on September 1 at 11 a.m.

On August 16 the National Society for the Prevention of Cruelty to Children reached a landmark in its history. On that day 5,000,000 children in England, Wales, and Ireland had been helped by the Society to enjoy a happy and healthy life which unfortunate family circumstances might have withheld from them.

Vaccination was made compulsory in Poland in 1921, with the result that there was only one case of small-pox in 1937, as compared with 5,078 cases, with 823 deaths, in 1921.

Professor Egaz Monis, the eminent Portuguese neurologist, was recently the victim of an attempted assassination in his consulting room.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS.—All communications should be addressed to the Advertisement Manager (office hours 9 a.m. to 5 p.m.). Orders for copies of the *Journal* and communications with reference to subscriptions should be addressed to the Secretary, B.M.A. House.

The TELEPHONE NUMBER of the British Medical Association and the *British Medical Journal* is EUSTON 2111.

The TELEGRAPHIC ADDRESSES are

EDITOR OF THE *BRITISH MEDICAL JOURNAL*, *Aitiology Westcent, London.*

SECRETARY, *Medisecra Westcent, London.*

The address of the B.M.A. Scottish Office is 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh;* telephone 24361 Edinburgh), and of the Office of the Cumann Doctúirí na h-Éireann (I.M.A. and B.M.A.), 18, Kildare Street, Dublin (telegrams: *Bacillus. Dublin;* telephone 62550 Dublin).

QUERIES AND ANSWERS

"Apfel Must" in Rheumatoid Arthritis

MR. A. P. BERTWISTLE, F.R.C.S.Ed. (London, W.1), writes: Have any of your readers had any experience of "apfel must" in the treatment of rheumatoid arthritis? The beneficial action of fermented apple juice, cider, has been known for a long time. The preparation of cider, especially the presses, is not a very appetizing process, whereas the preparation of a "must" has to be on strictly aseptic lines, no preservative being permitted. Recently I had a case of rheumatoid arthritis in a woman suffering from inoperable carcinoma of the breast. She was just able to get about her home and do little tasks. She then had deep *x*-ray therapy; the enforced rest in bed resulted in her knees becoming absolutely fixed with pain. The usual remedies caused no improvement, so "appella," a British product, was tried, with the result that her knees became quite free. Unfortunately the cachexia resulting from the carcinoma has prevented her walking, but the improvement in her rheumatic pain and stiffness has been striking.

Income Tax

Rooms Let Off to Assistant

"G. N." rents premises of which the ground floor is used as consulting and technical rooms, and the other two floors are let to his assistant for less than they are worth. The inspector of taxes refuses to allow as professional expenses more than one-half of the rent, rates, repairs, etc., as applicable to the professional portion.

*** As "G. N." would presumably have to pay a higher salary to his assistant if he charged him a full rent, we think he will have no difficulty in arranging with the inspector that the whole of the yearly expenses of the property be charged in his account, but the rent payable by the assistant brought in as professional receipts. He will then know that he is getting an equitable result. The cost of obtaining the lease represents capital outlay, and is not allowable.

Research Fellowship

"DELTA" inquires with regard to a claim to exemption from income tax of a seven-year research fellowship.

*** Section 28 of the Finance Act, 1920, exempts "income arising from a scholarship held by a person receiving full-time instruction at a university, college, school, or other educational establishment." The Commissioners who would deal with an appeal are authorized to obtain the opinion of the Board of Education through the Board of Inland Revenue. Our correspondent's case does not seem very convincing at first sight, but a decision involves knowledge of the detailed rules governing the award and the course of research. We suggest that "Delta" should call the attention of the inspector of taxes to the above-quoted section, and ask him to arrange for a ruling by the Board of Education.

Deduction for Clothing Expenses

"LAMBDA" inquires whether a claim can be supported not only for the cost of protective overalls used by an orthopaedic surgeon but also for the expense arising from the fact that such protection is necessarily imperfect.

*** We could not advise an appeal on the point. So far as equity goes, a professional man's activities frequently involve some higher range of clothing expense which is not allowed; from the point of strict law the Revenue has an effective reply in Rule 3 (*a*), Sch. D, Cases I and II—"no sum shall be deducted in respect of . . . expenses not being money wholly and exclusively laid out or expended for the purposes of the . . . profession." We are not aware of any case in which such an allowance has been given.

LETTERS, NOTES, ETC.

A Confusion of Names

DR. W. E. COOKE (Harley Street, London, W.1) writes: In your issue of August 5 appeared an obituary notice of Dr. W. E. Cooke of Wigan. The similarity of our initials has led to confusion between the late Dr. Cooke and myself for some considerable time. In addition he had been abroad in India and Malaya, as I have been. The fact that I have been for over fifteen years on the medical staff of the Hospital for Tropical Diseases at Euston, London, coupled with the strange coincidence that Dr. Edmund Cooke's death took place at Euston and was given considerable publicity in the Press, has unfortunately led to further considerable confusion of our identities by many friends, by patients, and by some professional colleagues. As even the heading of your admirable obituary notice (W. E. Cooke, M.D., F.R.C.P., etc.) quickly read might have possibly misled a few colleagues at home or abroad, I venture to send you this letter.

Windows

DR. RICHARD BELL (Northumberland) writes: For years it must have been obvious to country doctors that the sick-room in the modern poorer class of dwellings was too small and that the window space was in like proportion with the size of the room. There is something wrong when houses with large bedrooms and average-sized windows are condemned as having inadequate window space, whereas modern brick houses with tiny bedrooms and tiny windows are pressed upon the working classes—to languish in during the summer and to shiver in throughout our long winter. It appears that a small room demands a small window, whereas a large room requires a large window. It must be plain to any reasonable person that this is nonsense. In the Cheviots there is a story said to be true about a certain noble lord who fought a desperate but losing battle with the local authorities over the matter of a back door in an exposed shepherd's cottage. For generations this low grey house had turned a sturdy blank back wall to the prevailing blast, but a back door had to be put in despite the protests of landlord and tenant.

Cannabis Indica for Herpes Zoster

DR. C. E. MATTHEWS (Speldhurst, Kent) writes: A simple method of treating herpes zoster with the extract of cannabis indica is not so generally known as it deserves to be. I was a student at St. Thomas's Hospital attending the clinic of the late Dr. J. S. Bristowe when he treated with this drug an elderly female patient admitted with severe pains following herpes zoster. In two days she was completely cured. I made a note of it at the time in my copy of the fifth edition of his *Theory and Practice of Medicine*, in which it is not mentioned. I never forgot this case, and when in course of time cases of shingles came under my care I used the drug with invariable success. The extract

was prescribed in pill form, 1/4 to 1/2 grain, according to age, three times a day. Although long retired from practice I recently used this treatment for my housemaid who developed shingles. Relief from the pains quickly followed its administration. Having in mind the close relationship between herpes zoster and varicella, I regret the missed opportunities of treating the latter with cannabis indica when I was in charge of one of the Metropolitan hospitals for infectious diseases. It may allay the irritation of the rash, and I offer the suggestion to anyone who may be interested.

Sir James Mackenzie's Heart

DR. A. MURDOCH (Bexhill-on-Sea) writes: It is a singular coincidence that your editorial on Sir James Mackenzie's heart (July 22, p. 178) should appear in the *Journal* after the publication of three letters on control of functioning, as the last time I saw my friend, which was just a few months before his death, we had an argument about the way he was "using" himself—that is, controlling his functioning in relation to his anginal pain. I was a fellow sufferer, as he and others had diagnosed that the incapacity from which I suffered was anginal; he had ordered me a long rest and to live within my limitations. At that time I had broken away from all orthodox treatment and was receiving re-education lessons in the use of myself by conscious control from F. Matthias Alexander. Sir James Mackenzie was very scornful about this, and to my remark that he was "using" himself very badly in the way he was sitting he replied: "And why can't I sit like this?" The point of this letter is to draw attention to the fact that now when I am entering my 78th year and after sixteen years of "using" myself according to the principles laid down by Alexander, I have kept free from angina, am still in practice, and am able to lead an active life with, of course, some of the limitations due to my age. I would like to add that whereas Alexander's theory and technique were based on empirical ideas at first, they are now known to be based on definite anatomical and physiological principles.

A.R.P. Car Shield

A steel shield has recently been devised to protect saloon-type motor cars and ambulances from falling shell fragments and debris in time of war. The shield can be mounted or removed by two untrained persons in about two minutes, and it requires no special brackets. It cannot damage the car in any way, and does not appreciably affect its normal performance or driving visibility. The shield covers the entire roof, and projects over the driver's legs and also at the rear to protect passengers in the back seat from fragments falling at a sharp angle. It also extends beyond the roof of the car to either side, though it does not project further than the outer edge of the running-board. Supporting blocks ensure a proper distribution of the weight and are covered with rubber to prevent damage to the paintwork. The shield can be fitted to any saloon car, whether the roof be of fabric or of metal. The cost is approximately £4 for a medium-sized car. Inquiries should be addressed to the Secretary, Ace of Spades Petroleum Company, Ltd., Great West Road, Hounslow, Middlesex.

Delayed Union of Fractures

DR. R. LARKIN (London, S.E.) writes: In the *Journal* of July 29 (p. 219), in an article on delayed union and non-union of fractures, Mr. R. I. Stirling states: "Mineral salt deficiency *per se* is seldom, if ever, responsible for delayed union or non-union of fractures." I wrote a letter to the *Journal* in 1916 showing that this chemical deficiency operates more frequently than is supposed, and dates from the time when Stimson, surgeon-in-command of the Northern Army during the American Civil War, found that this cause was operative—no doubt in the first place from lack of food in the field—from loss through shock of the mineral salts of the blood, particularly phosphates; the output of phosphates in the urine is not noticeably increased, but a considerable quantity of phosphates is lost by the intestinal secretion. My first case was that of a patient who had been in hospital for nine months; replating, screwing, and adjusting splints had been tried in vain, also thyroid administration, *x* rays, and freshening the ends of the bones. The patient was a post-office worker under the care of the post office medical officer, who was nonplussed by the case and asked my opinion. I advised prescribing syr. ferri phos. co.; my advice was followed, with the result that the patient went back to work cured in a few weeks' time with the callus as hard as iron. I remember many such cases; in one, that of a sergeant-major with Jacksonian epilepsy, instead of trephining I found the exhibition of syr. ferri phos. co. turned the exuberant callus of the gunshot wound of the head into bone and withdrew the pressure from the cerebral cortex. He went back to his regiment recovered. It is quite likely, although Mr. Stirling pronounces the local blood condition normal, that there is some hormonic influence in the treatment that prevents further loss of phosphates and helps the general nervous system to build up the bone. I have treated an intracapsular fracture of the patella like this, and with early movements got the patient walking about in five weeks' time.

Children in War Time

Billeting in Brief is a pamphlet which has just been issued jointly by the National Union of Teachers and the Save the Children Fund. It summarizes information which has appeared in Government and other publications in anticipation of a state of war, and gives in simple form advice and instruction which should be useful to those who might be called upon to look after groups of children. Preparations which should be made for evacuating children are detailed, as are the arrangements necessary for their reception in the areas to which they are taken. Supplementing the general hints there are three appendices giving suggestions for the feeding of children of different ages. These have been contributed by Professor V. H. Mottram. Copies of this pamphlet (price 2d.) may be ordered through any bookseller, or may be obtained direct from the Save the Children Fund, 20, Gordon Square, W.C.1.

Chronic Mastitis

DR. SIDNEY PERN (Ballarat, Victoria) writes: I am pleased to see that Mr. H. J. B. Atkins (*Journal*, April 29, p. 866) has pointed out that chronic mastitis "falls into line with the established procedure of Nature in dealing with infectious diseases." I have for a number of years been treating this condition as a specific elective invasion from some chronic focus, the removal of which has resulted in the disappearance of the mastitis. It would be unreasonable to assume that the breast escaped local invasion any more than joints, myocardium, kidneys, or any other tissue, so we have to reconstruct in our minds what sort of pathological picture would be the result of such an invasion going on for months at a time. If by removal of all infected foci consistently satisfactory results be obtained, as has been my own experience, it would be reasonable to assume that the infection was the cause of the condition. Chronic irritation applied to cells which have the power of proliferation sooner or later produces that proliferation, which if carried on indefinitely causes reversion to a more primitive type. The liberation of bacterial toxins produces the necessary irritant. Mr. Atkins, with his large clinic at Guy's, would have ample opportunity to prove or disprove this contention.

Disclaimer

DR. ALAN MABERLY writes: In view of the undesirable and unsolicited Press publicity following the lecture given by me at the Summer School of the British Social Hygiene Council at Oxford, culminating in an article by a Sunday newspaper correspondent based upon an alleged interview with me, I would be grateful if you would publish this disclaimer. All Press correspondents were excluded from my lecture at Oxford, and I have no idea whence the garbled account issued to the Press originated. Subsequently I was informed that an article in a Sunday newspaper had been commissioned, arising from a statement I had been reported to have made. The alleged interview occupied precisely three minutes and was devoted to requesting and obtaining an assurance that my name would not be used in any way in connexion with such an article.

Corrigendum

There was a misprint in the text of Sir Joseph Barcroft's paper on Food Conservation in Relation to National Food Supply published last week. On page 326, column 1, line 19 from the foot, the phrase "washed potato" should have been "mashed potato."